

YAMAHA



SERVICE MANUAL

EF1000A

LIT-19616-00-83

FOREWORD

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha generators have a basic understanding of the mechanical precepts and procedures inherent to generator repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit for use and/or unsafe.

Yamaha Motor Company Ltd. is continually striving to further improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

NOTE:

This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully

**EF1000A
SERVICE MANUAL**

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LIT-19616-00-83**

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.



The Safety Alert Symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

WARNING

Failure to follow **WARNING** instructions could result in severe injury or death to the machine operator, a bystander, or person inspecting or repairing the machine.

CAUTION:

A **CAUTION** indicates special precautions that must be taken to avoid damage to the machine.

NOTE:

A **NOTE** provides key information to make procedures easier or cleaner.

MANUAL FORMAT

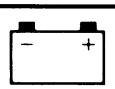
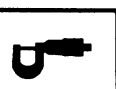
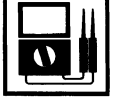
The procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.

In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

- Bearings
Pitting/Damage→Replace.

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease in identifying the correct disassembly and assembly procedures.

① GEN INFO 	② INSP ADJ 
③ ENG 	④ ELEC 
⑤ SPEC 	
⑥ 	⑦ 
⑧ 	⑨ 
⑩ 	⑪ 
⑫ 	⑬ 
⑭ 	⑮ 
⑯ 	⑰ New

ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑤ are designed as thumb tabs to indicate the chapter's number and content.

- ① General information
- ② Periodic inspection and adjustment
- ③ Engine
- ④ Electrical
- ⑤ Specifications

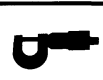
Illustrated symbols ⑥ to ⑫ are used to identify the specifications appearing.

- ⑥ Special tool
- ⑦ Filling fluid
- ⑧ Lubricant
- ⑨ Tightening
- ⑩ Wear limit, clearance
- ⑪ Engine speed
- ⑫ Ω , V, A

Illustrated symbols ⑬ to ⑰ in the exploded diagram indicate grade of lubricant and location of lubrication point.

- ⑬ Apply molybdenum disulfide oil
- ⑭ Apply engine oil
- ⑮ Apply lightweight lithium soap base grease
- ⑯ Apply locking agent (LOCTITE®)
- ⑰ Use New one

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ELECTRICAL	 ELEC 4
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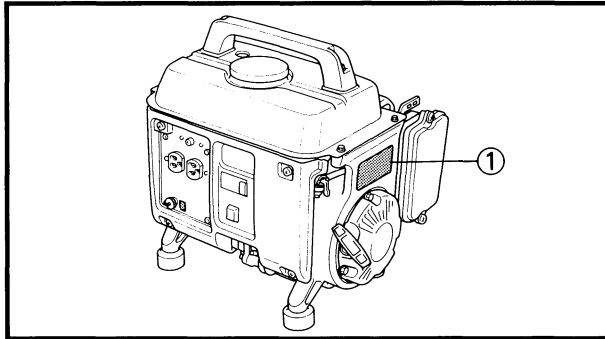
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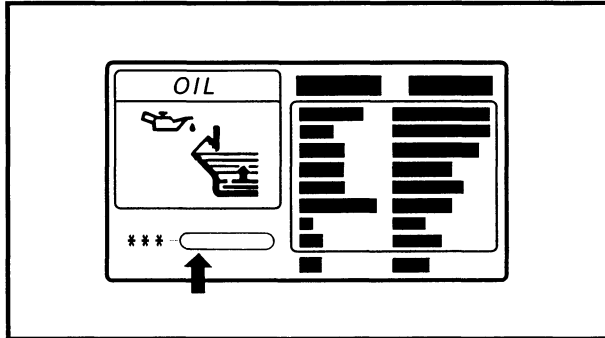
GENERAL INFORMATION

MACHINE IDENTIFICATION ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the right side of the body

NOTE:

The first three digits of these numbers are for model identification; the remaining digits are the unit production number.



STARTING SERIAL NUMBER

EF1000A	7TA-200101~
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NOTE:

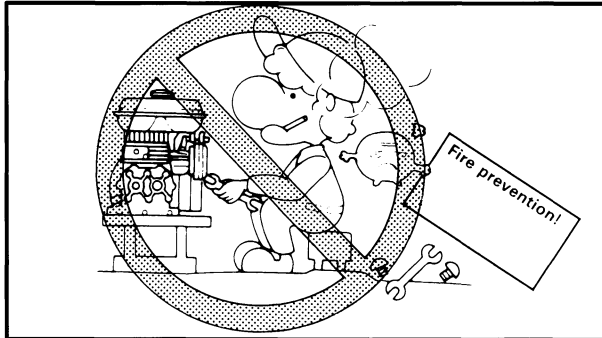
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IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

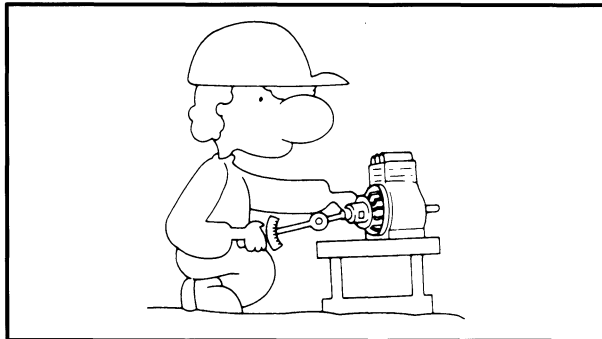
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NOTES ON SERVICE

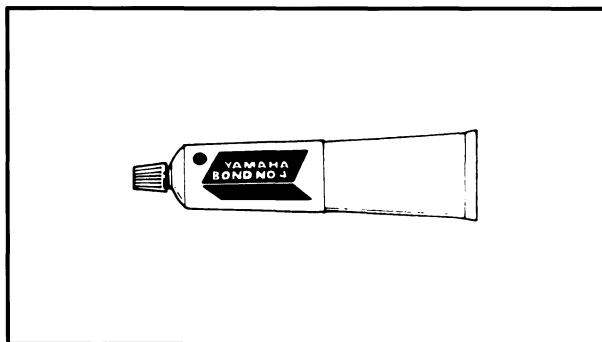
1. Fire prevention

When servicing the engine, always keep away from fire.



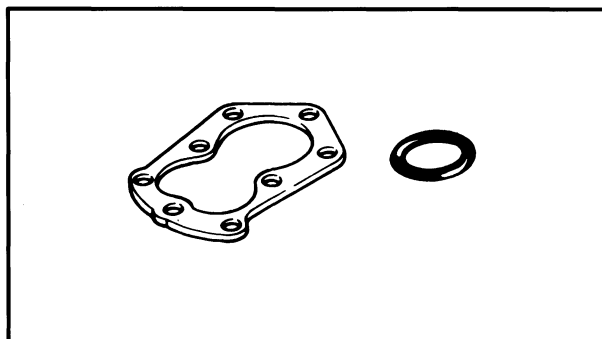
2. Right tools

Be sure to use the right special tool for the job to guard against damage.



3. Oil, grease and sealers

Be sure to use genuine Yamaha oils, greases and sealers, or the equivalents.

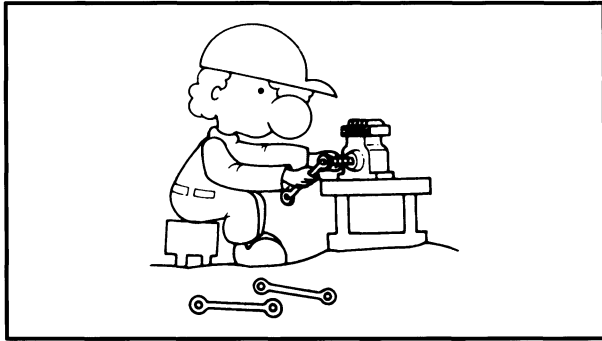


4. Expendable parts

Always replace gaskets, O-rings, cotter pins, and circlips with new parts when servicing engine.

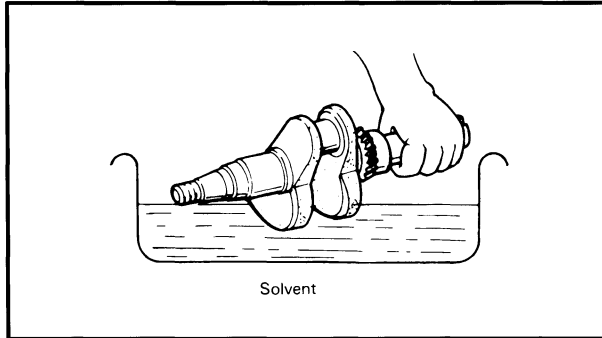
IMPORTANT INFORMATION

GEN
INFO



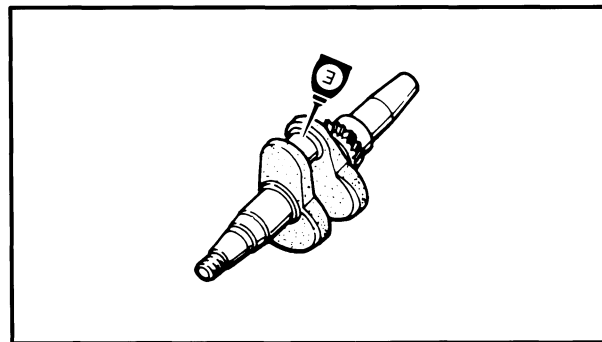
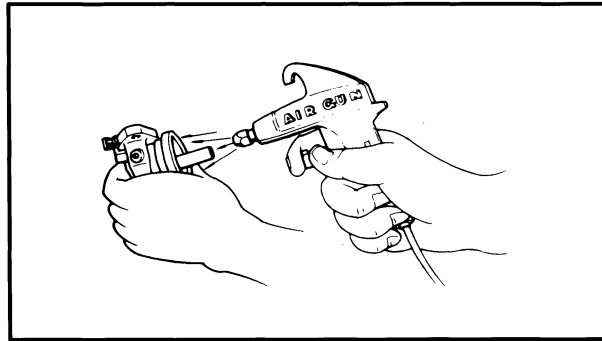
5. Tightening torque

Be sure to follow torque specifications. When tightening bolts, nuts or screws, start with the largest-diameter one and work from an inner position to an outer position in a crisscross pattern.



6. Notes on disassembly and assembly

a. Parts should be cleaned in solvent and blown dry with compressed air after disassembly.



b. Contact surfaces of moving parts should be oiled when reassembled.

c. Make sure that parts move smoothly after each section of the machine is assembled.

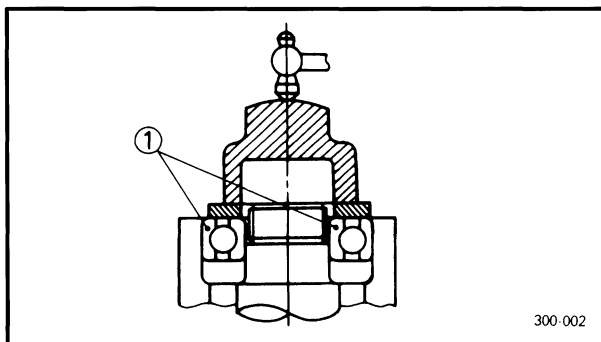


ALL REPLACEMENT PARTS

1. We recommend to use Yamaha genuine parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment.

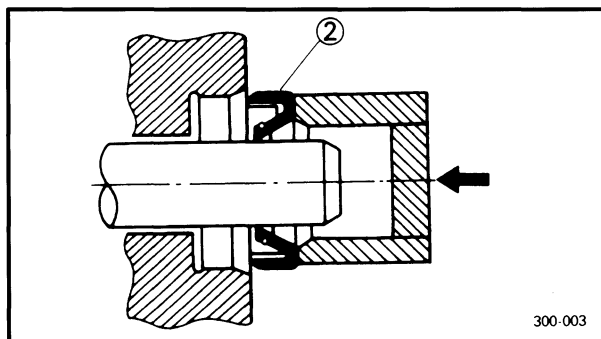
GASKETS, OIL SEALS, AND O-RINGS

1. All gaskets, seals, and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips, and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



BEARINGS AND OIL SEALS

1. Install the bearing(s) ① and oil seal(s) ② with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of light-weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.



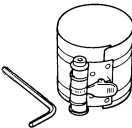
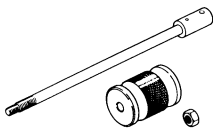
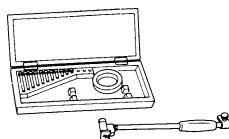
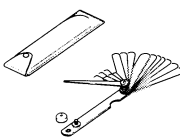
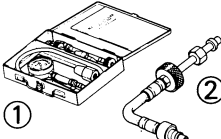
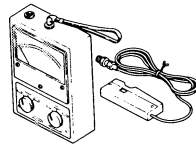
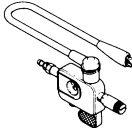
CAUTION:

Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.

SPECIAL TOOLS

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools; this will help prevent damage caused by the use of inappropriate tools or improvised techniques.

When placing an order, refer to the list provided below to avoid any mistakes.

Tool No.	Tool name / Usage	Illustration
YU-33294 (90890-05158)	Piston ring compressor This tool is used to compress the piston rings when installing the piston.	
YU-1047	Rotor shock puller set These tools are used when removing the rotor.	
YU-03016 (90890-03016)	Cylinder gauge (35~60 mm) This gauge is used to measure the cylinder inside diameter.	
YU-26900-9 (90890-03079)	Service gauge (Thickness gauge) This gauge is used to measure the valve clearance.	
YU-33223 (90890-03081) YU-33223-3 (90890-04082)	Compression gauge set ① Adaptor ② These tools are used to measure the engine compression.	
YU-03112 (90890-03112)	Pocket tester These instrument is invaluable for checking the electrical system.	
YU-8036-A (90890-03113)	Indicative tachometer These instrument is invaluable for reading the engine rpm.	
(90890-06754)	Ignition checker This instrument is necessary for checking the ignition system components.	



PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable machine operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to machines already in service as well as new machines that are being prepared for sale. All service technicians should be familiar with this entire chapter.

MAINTENANCE INTERVALS CHART

Proper periodic maintenance is important. Especially important are the maintenance services related to emissions control. These controls not only function to ensure cleaner air but are also vital to proper engine operation and maximum performance. In the following maintenance tables, the services related to emissions control are indicated as “***” in the chart.

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

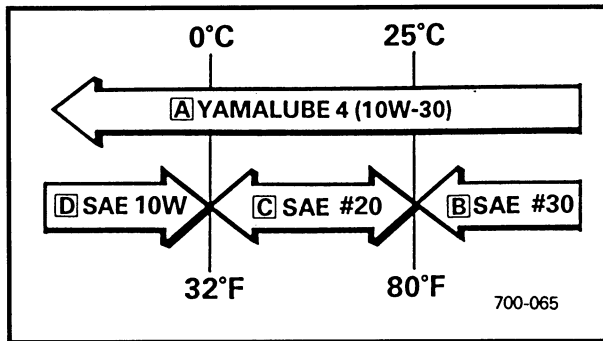
No.	Item	Remarks	Pre-Operation check (daily)	Initial	Every		
				1 month or 20 hr	3 months or 50 hr	6 months or 100 hr	12 months or 300 hr
1.	** Spark plug	Check condition, adjust gap and clean. Replace if necessary.			●		
2.*	** Valve clearance	Check and adjust when engine is cold.					●
3.*	** Crankcase breather system	Check breather hose for cracks or damage. Replace if necessary.					●
4.*	** Idle speed	Check and adjust engine idle speed.					●
5.	** Exhaust system	Check for leakage. Retighten or replace gasket if necessary.	●				
		Check spark arrester. Clean/replace if necessary.					●
6.	** Engine oil	Check oil level.	●				
		Replace.		●		●	
7.	** Air filter	Clean. Replace if necessary.			●		
8.	Fuel filter	Clean fuel petcock and fuel tank filter. Replace if necessary.				●	
9.	Fuel line	Check fuel hose for cracks or damage. Replace if necessary.	●				
10.	** Choke lever	Check choke operation.	●				
11.	Cooling system	Check for fan damage.					●

PERIODIC MAINTENANCE / LUBRICATION INTERVALS

INSP
ADJ



No.	Item	Remarks	Pre-Operation check (daily)	Initial	Every		
				1 month or 20 hr	3 months or 50 hr	6 months or 100 hr	12months or 300 hr
12.	** Starting system	Check recoil starter operation.	●				
13.	** Decarbonization	More frequency if necessary.					●
14.	Fittings/fasteners	Check all fittings and fastners. Correct if necessary.				●	



ENGINE ENGINE OIL



Recommended oil:

A YAMALUBE 4 (10W-30) or
SAE 10W-30 type SE

B SAE #30

C SAE #20

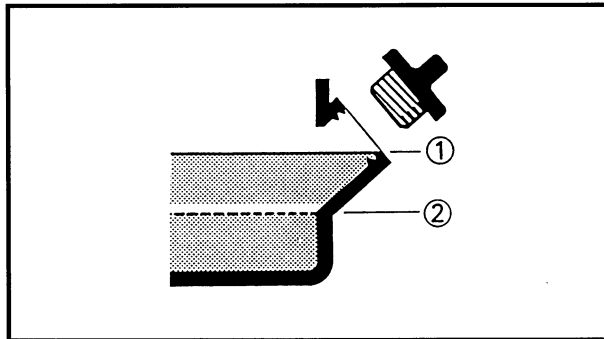
D SAE 10W

Engine oil quantity:

0.43 L (0.38 Imp qt, 0.45 US qt)

NOTE:

Recommended engine oil classification:
API Service "SE" or "SF", if not available,
"SD".



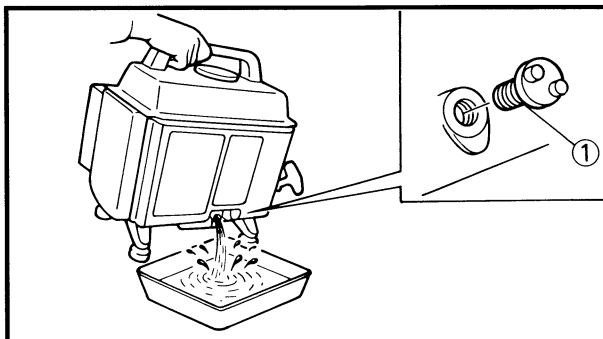
Oil level inspection

1. Check:
 - Oil level

Oil level adjustment steps:

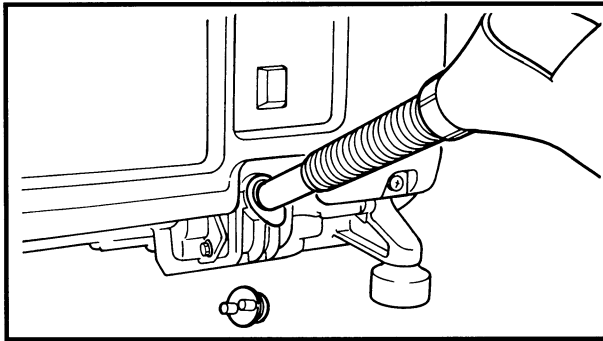
- Place the engine on a flat surface.
- Warm up the engine for a few minutes.
- Stop the engine.
- Make sure that the engine oil is between the upper and lower levels. Add oil as necessary.

- ① Upper level
- ② Lower level

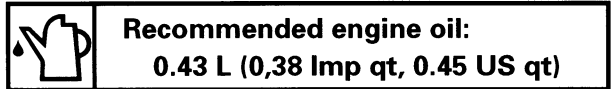


Oil replacement

1. Warm up the engine oil for several minutes.
2. Place a receptacle under the engine.
3. Remove:
 - Oil filler cap ①
 Tilting as shown the engine while the engine oil draining.

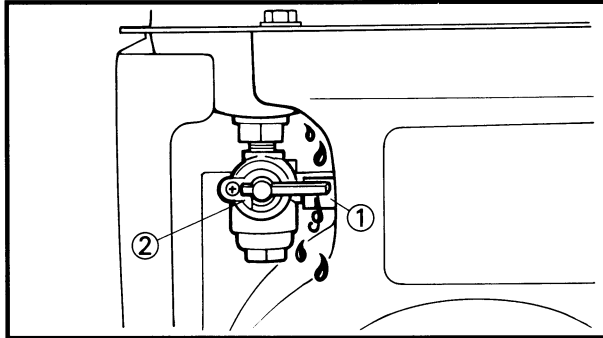


4. Fill:
 - Engine oil



CAUTION:

Do not allow foreign material to enter the crankcase.



5. Install:
 - Oil filler cap

FUEL LINE INSPECTION

1. Inspect:
 - Fuel hose ①
 - Fuel petcock ②

Clacks/damage→Replace.
Poor connection→Correct.

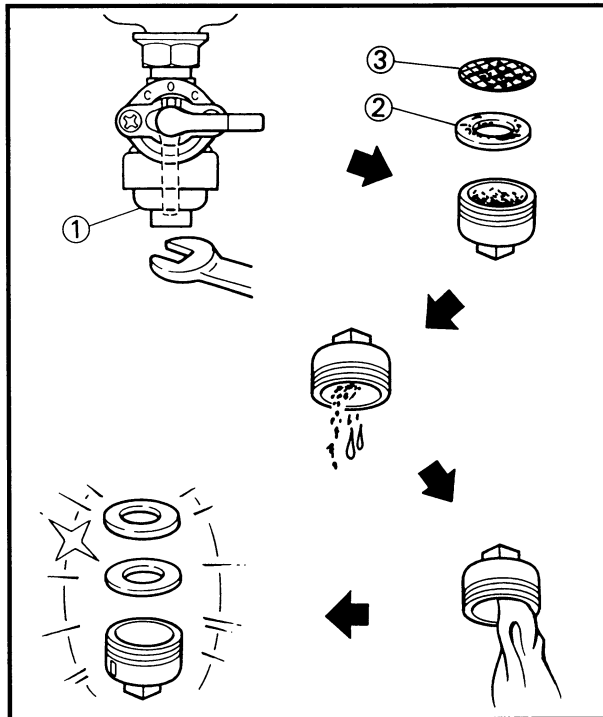
FUEL PETCOCK

Removal and inspection

1. Turn the fuel petcock lever the "C" position.
2. Inspect:
 - Fuel petcock cup ①
 - Connection→Clean.
 - Gasket ②
 - Damage→Replace.
 - Strainer ③
 - Contamination→Clean.

NOTE:

Clean the cup with solvent and dry it off.



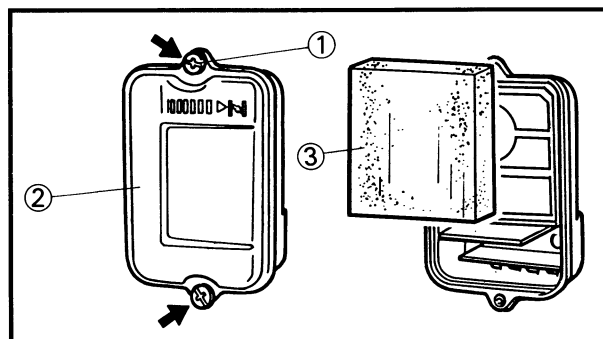
3. Install:
 - Fuel petcock cup

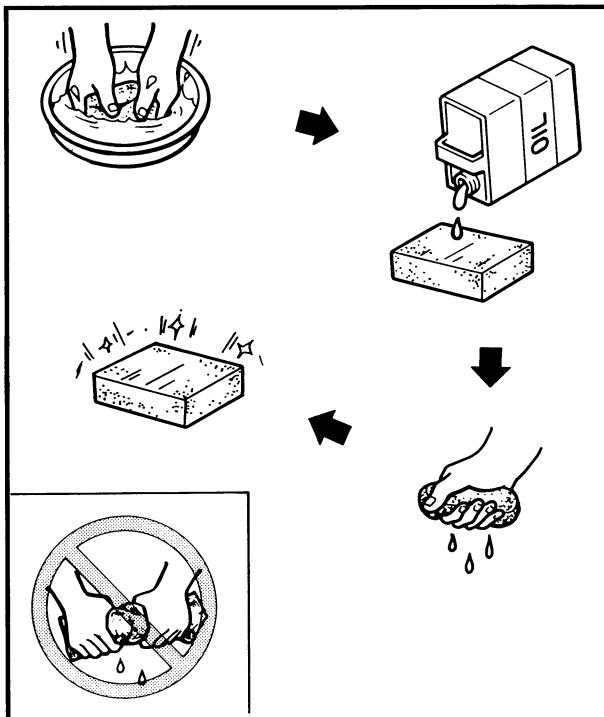
	1.5 Nm (0.15 m•kg, 1.1 ft•lb)
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AIR FILTER

1. Remove:
 - Bolt ①
 - Air filter cover ②
 - Air filter element ③

Refer to "AIR FILTER".





2. Inspect:

•Element

Clogging→Wash the element in a solvent and dry it.

Oil the element and squeeze out the excess oil.

Damage→Rplace.



Recommended oil:

Form-air-filter oil or
SAE #20 motor oil

3. Inspect:

•Air filter element

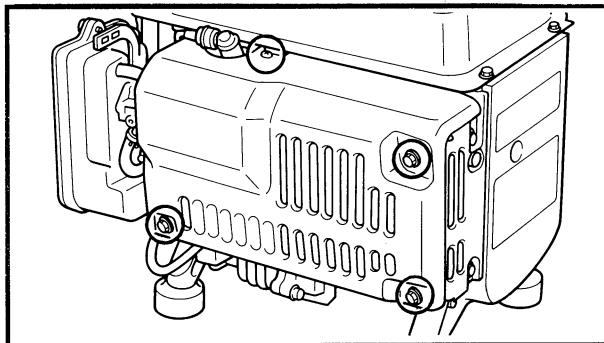
•Air filter cover

NOTE:

Do not wiring out the element; this could cause it to tear.

CAUTION:

The engine should never be run without the air filter element; excessive piston and/or cylinder wear may result.



MUFFLER

1. Remove:

•Muffler protector

•Muffler

Refer to "MUFFLER" .

2. Remove:

•Plate ①

3. Clean:

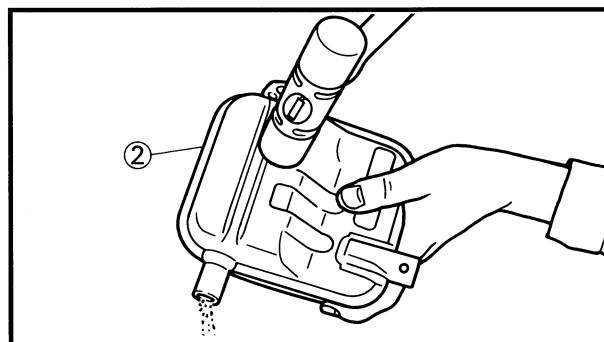
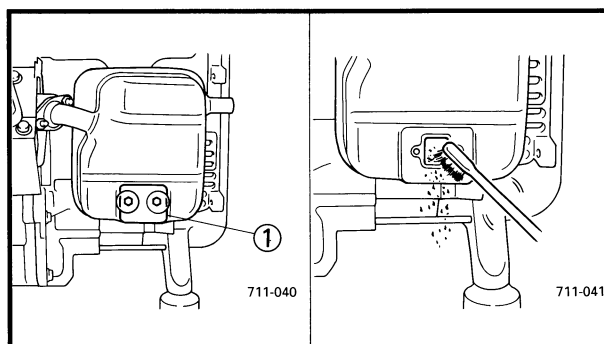
•Exhaust pipe

•Muffler body ②

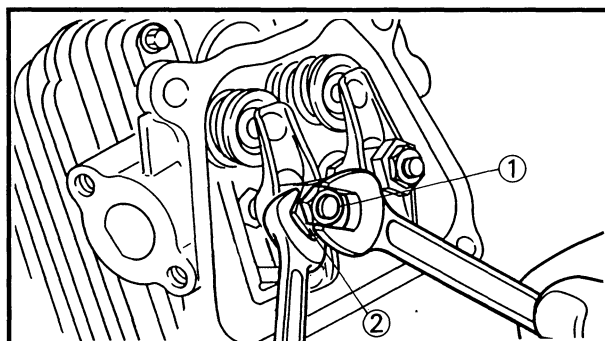
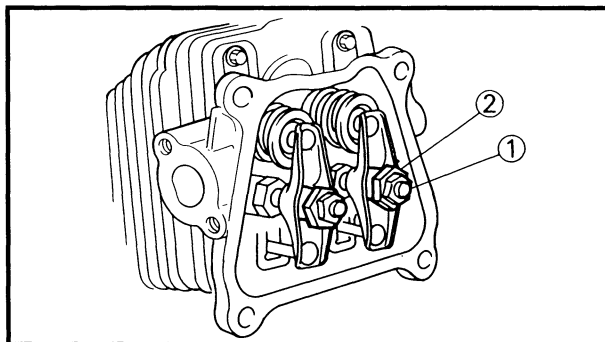
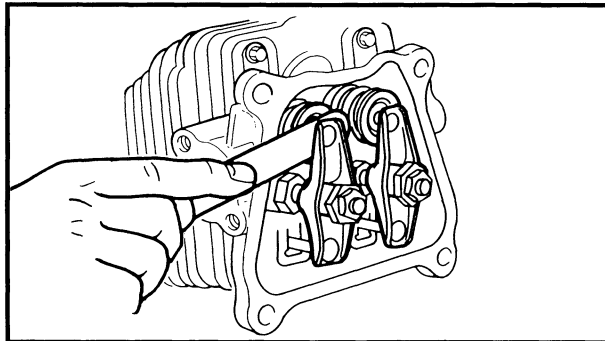
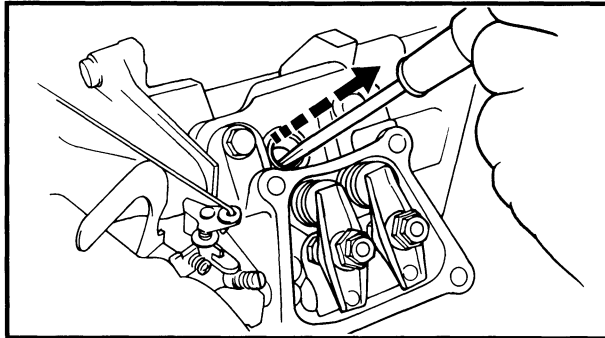
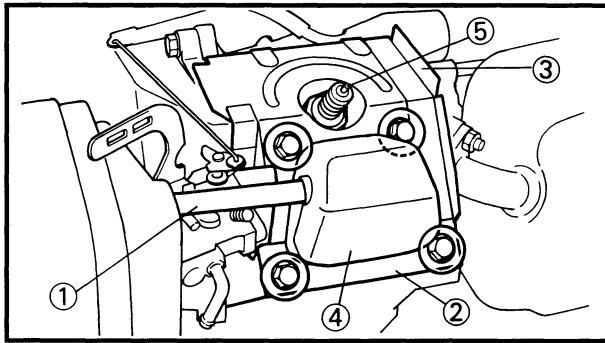
To loosen carbon buildup tap on the muffler, in the area shown in the illustration. Then, shake the carbon pieces out of the end of the muffler.

CAUTION:

Do not use a wire to the inside of the muffler or the noise damping material may come out, reducing the damping effect.



VALVE CLEARANCE ADJUSTMENT



VALVE CLEARANCE ADJUSTMENT

NOTE: _____
Valve clearance must be measured when the engine is cool to touch.

1. Remove:
 - Fuel tank
 - Breather hose ①
 - Air shroud (under) ②
 - Air shroud (upper) ③
 - Cylinder head cover ④
 - Spark plug ⑤
2. Pull the starter rope until the piston touches the screwdriver. the piston is then at TDC.
3. Inspect:
 - Valve clearance
 Out of specification→Adjust.



Standard valve clearance:

Intake valve (cold)

0.1 mm (0.004 in)

Exhaust valve (cold)

0.1 mm (0.004 in)



Service gauge:

YU-26900-9 (90890-03079)

Valve clearance adjustment

1. Turn the crankshaft until the piston reaches top dead center (T.D.C.).
2. Loosen the locknut ① and insert the 0.1 mm (0.04 in) thickness gauge between the rocker arm and the valve top.
3. Turn the adjuster ② in or out to obtain the proper valve clearance. Move the thickness gauge up and down to check for the proper resistance.

Adjuster	Resistance	Valve clearance
Turn in	Increase	Decrease
Turn out	Decrease	Increase

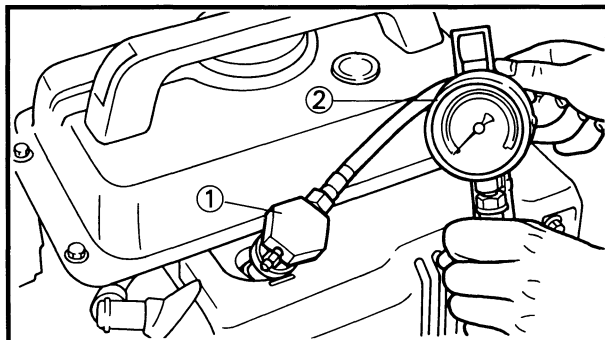
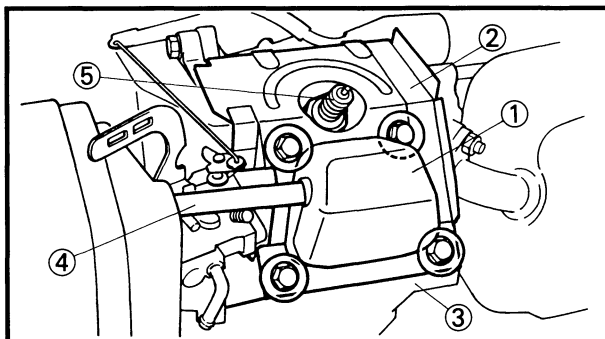
4. Tighten the locknut ①

10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE: _____
Be sure the hold the adjuster ② when tighten the locknut.

VALVE CLEARANCE ADJUSTMENT/ COMPRESSION PRESSURE MEASUREMENT

INSP
ADJ



5. Install:
 - Cylinder head cover gasket
 - Cylinder head cover ①
 - Air shroud (upper) ②
 - Air shroud (under) ③
 - Breather hose ④
 - Spark plug ⑤

6. Tighten:
 - Cylinder head cover

 **9 Nm (0.9 m•kg, 6.5 ft•lb)**

COMPRESSION PRESSURE MEASUREMENT

Insufficient compression pressure will result in performance loss and may indicate leaking valves or worn or damaged piston rings.

1. Measure:
 - Valve clearance
2. Warm up the engine for several minutes, then stop the engine.
3. Remove:
 - Spark plug
4. Connect:
 - Adapter ①
 - Compression gauge ②



Compression gauge set:
YU-33223 (90890-03081)
Adapter:
YU-33223-3 (90890-04082)

5. Measure:
 - Compression

To measure the compression, pull the recoil starter until the needle stops rising on the compression gauge.



Standard compression pressure:
100 kPa (10 kg/cm², 14.2 psi)

⚠WARNING

To prevent the sparking when cranking the engine, ground the spark plug wire.

Compression test steps (below minimum levels):

- Squirt a few drops of oil into the cylinder.
- Measure the compression again

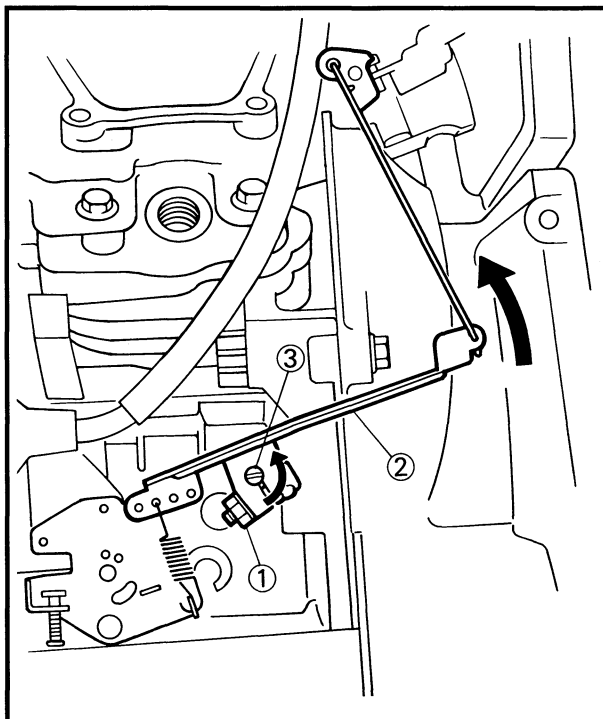
Reading	Diagnosis
If higher than without oil	• Worn cylinder, piston and piston ring.
If the same as without oil	• Defective piston, ring(s), valve(s) and cylinder head gasket. • Improper valve timing and valve clearance.

Compression test steps (above maximum levels):

- Check the cylinder head, valve surfaces, and piston crown for carbon deposits.

CYLINDER HEAD DECARBONIZATION

1. Remove:
 - Carbon depositsRefer to "CYLINDER HEAD INSPECTION"



GOVERNOR ADJUSTMENT

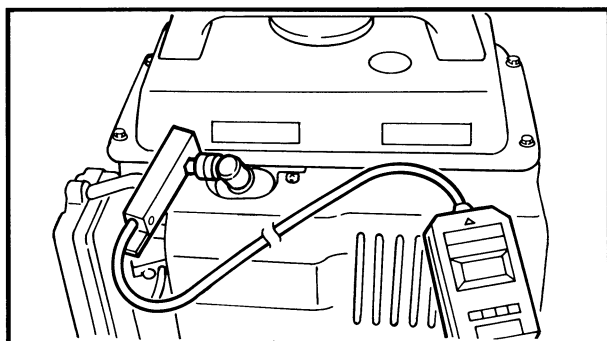
1. Remove:
 - Fuel tank
2. Adjust:
 - Governor

Governor adjustment steps:

1. Loosen the nut ①.
2. Turn the governor arm ② counterclockwise until it stops.
3. Turn the governor shaft ③ counterclockwise until it stops.
4. Tighten the nut.

ENGINE SPEED ADJUSTMENT/ BREATHER HOSE INSPECTION/SPARK PLUG

INSP
ADJ



ENGINE SPEED ADJUSTMENT

1. Adjust:
 - Engine speed (with no load)

Engine speed adjustment steps:

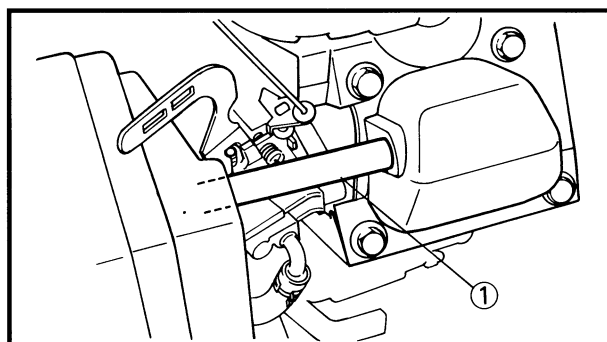
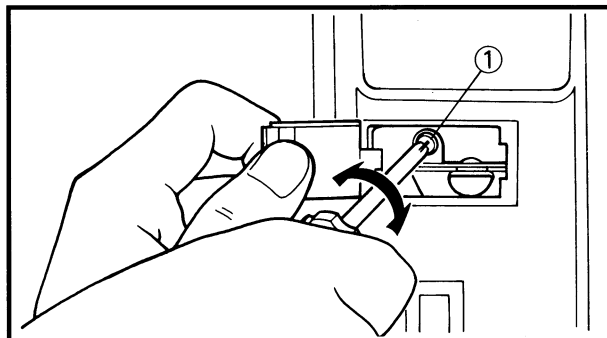
1. Install the Tachometer .
2. Start the engine and let it warmup for a few minutes.
3. Adjust the engine speed by turning the throttle stop screw ① in or out.



Engine speed (with no load):
60 Hz 3,700~3,850 rpm



Inductive tachometer:
YU-8036-A (90890-03113)



BREATHER HOSE INSPECTION

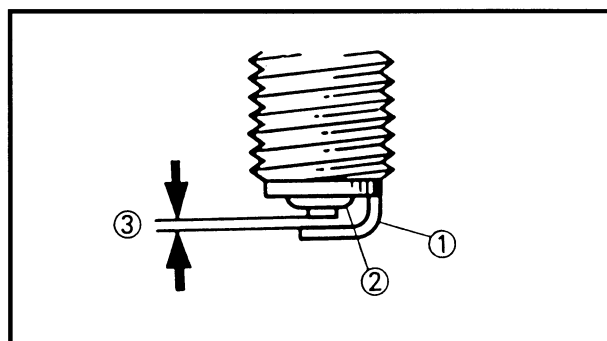
1. Inspect:
 - Breather hose ①
 - Clacks/damage→Replace.
 - Poor connection→Correct.

SPARK PLUG

1. Remove:
 - Spark plug

CAUTION:

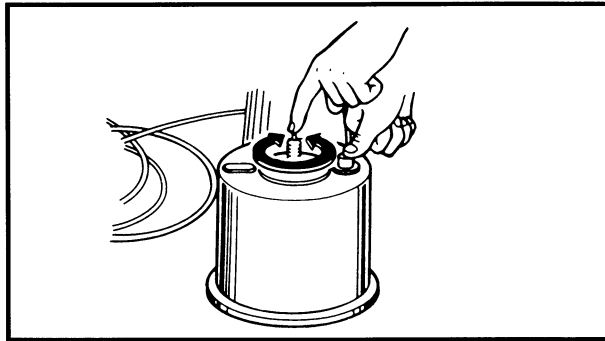
Before removing the spark plug, use compressed air to clean the cylinder head cover to prevent dirt from falling the engine.



2. Inspect:
 - Electrode ①
 - Wear/damage→Replace.
 - Insulator color ②
3. Measure:
 - Plug gap ③
 - Use a Wire gauge or thickness gauge.
 - Out of specification→Replace.



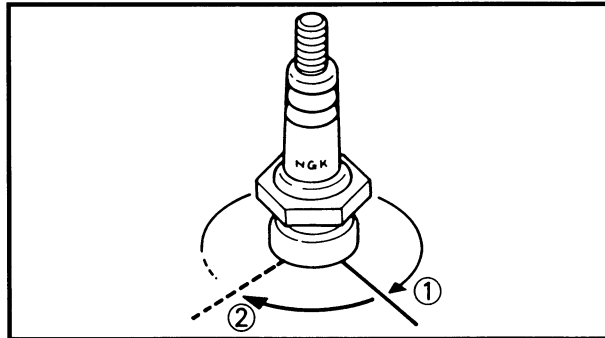
Spark plug gap:
0,6~0,7 mm (0,024~0,028 in)



If necessary, clean the spark plug with a spark plug cleaner.

Standard spark plug:
Resistored spark plug : BPR6HS

Before installing the spark plug, clean the gasket surface and plug surface.



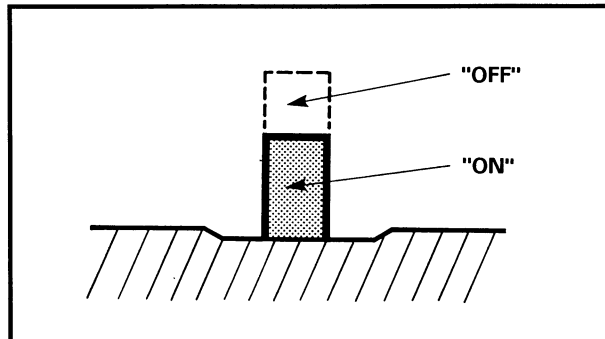
4. Tighten:

• Spark plug ①

 **20 Nm (2.0 m·kg, 14 ft·lb)**

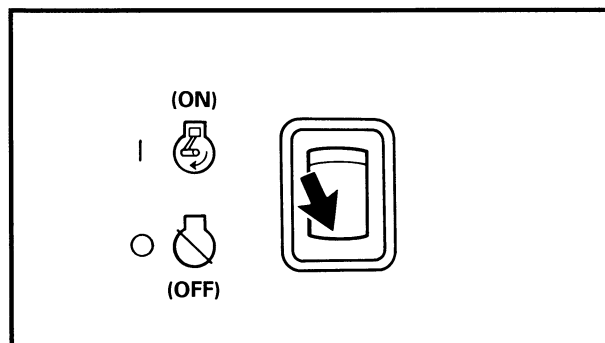
NOTE:

Finger tighten ① the spark plug before torquing ②, to prevent thread damage.



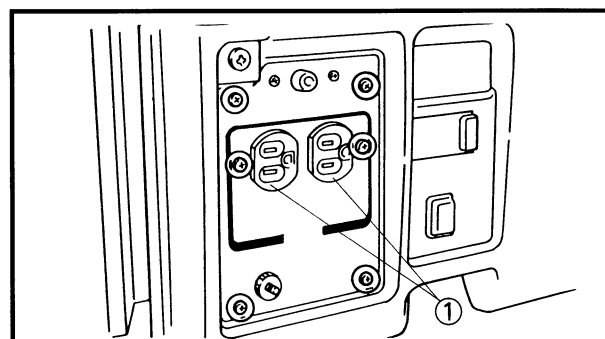
A.C. PROTECTOR INSPECTION

1. Check the protector "ON" position.
2. Connect the pocket tester (A.C.120 V) to the receptacle and inspect the output the A.C. current.
3. The protector "OFF" position, does not output the A.C. current.



ENGINE SWITCH INSPECTION

1. Check the switch "I"(ON) position.
2. Start the engine.
3. Inspect:
 - Engine switch operation
 - If the switch position turn "O"(OFF), stop the engine.
 - Engine switch is not operation→Replace.

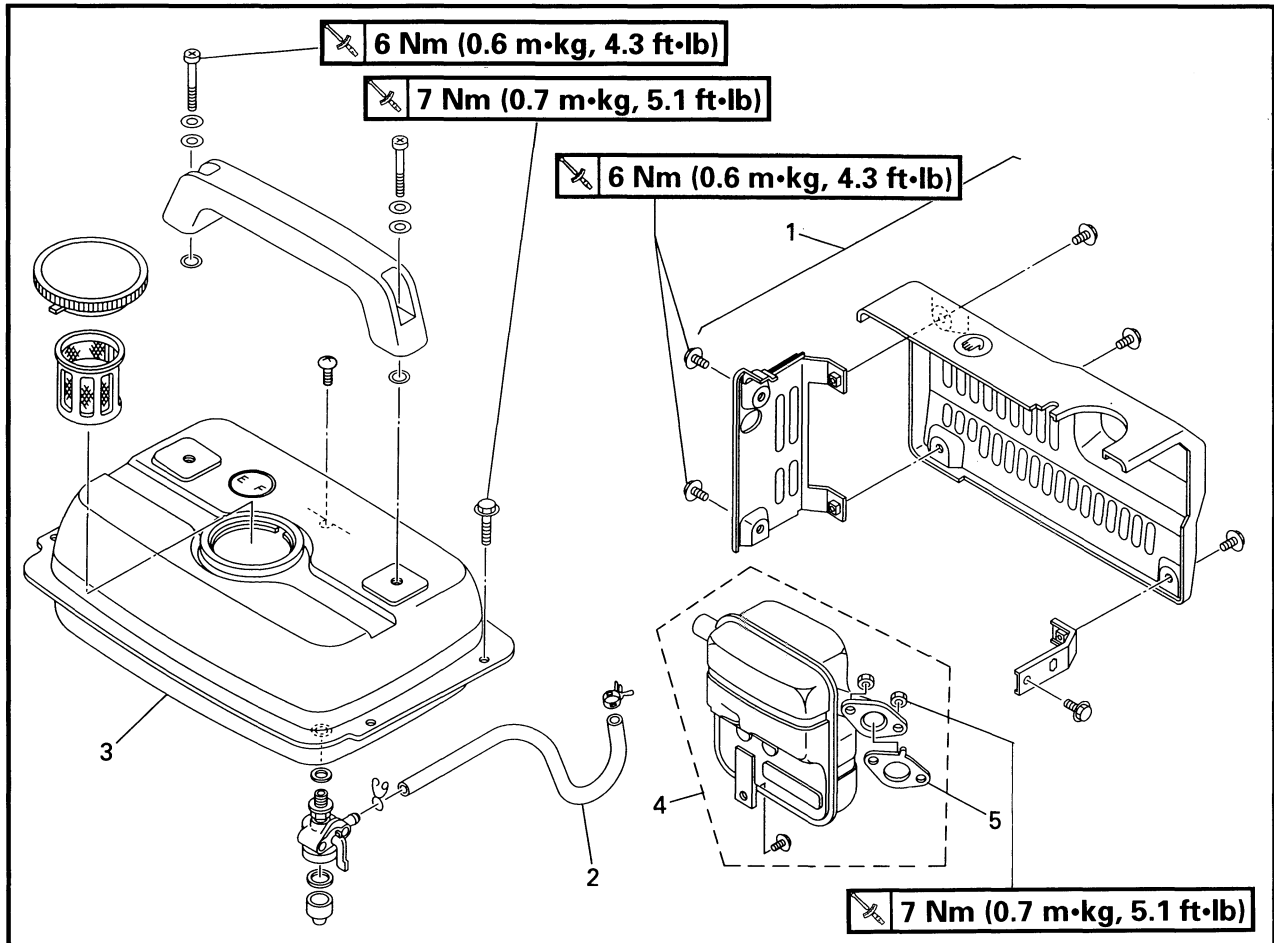


A.C. RECEPTACLE INSPECTION

1. Inspect:
 - A.C. receptacle ①
 - Clacks/damage→Replace.
 - Poor connection→Correct.



ENGINE ENGINE OVERHAUL MUFFLER PROTECTOR, FUEL TANK AND MUFFLER



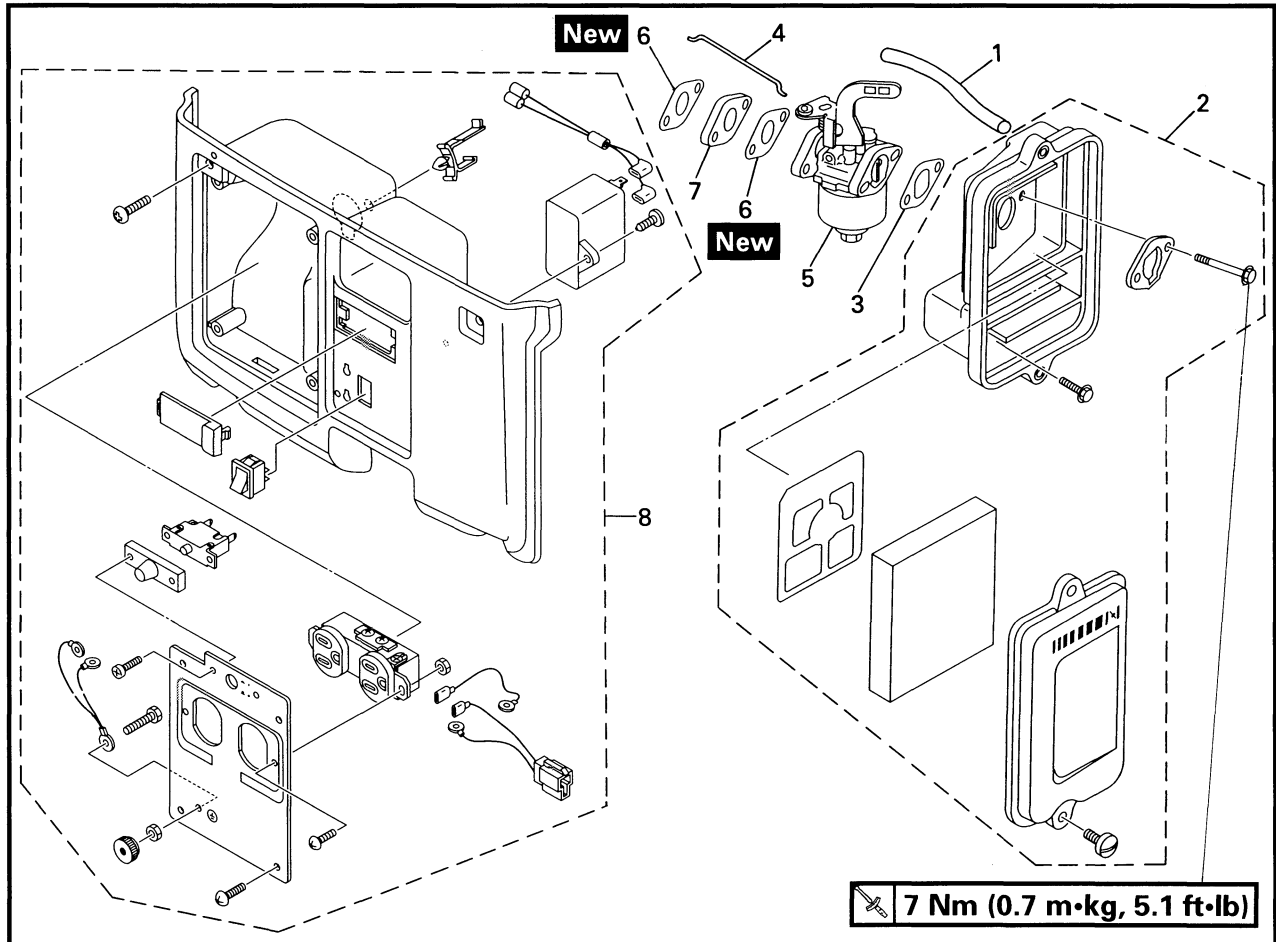
3

JOB INSTRUCTION CHART

Order	Job name/Parts name	Q'ty	Remarks
	Muffler protector, fuel tank and muffler removal		Remove the parts in the order below.
1	Muffler protector	1	NOTE: Disconnect the fuel hose, turn the fuel petcock position to the "C" position.
2	Fuel hose	1	
3	Fuel tank	1	Refer to "MUFFLER".
4	Muffler assembly	1	NOTE: Be sure install the gasket, projection side to upward.
5	Gasket (muffler)	1	For installation, reverse the removal procedure.



AIR FILTER, CARBURETOR AND CONTROL BOX

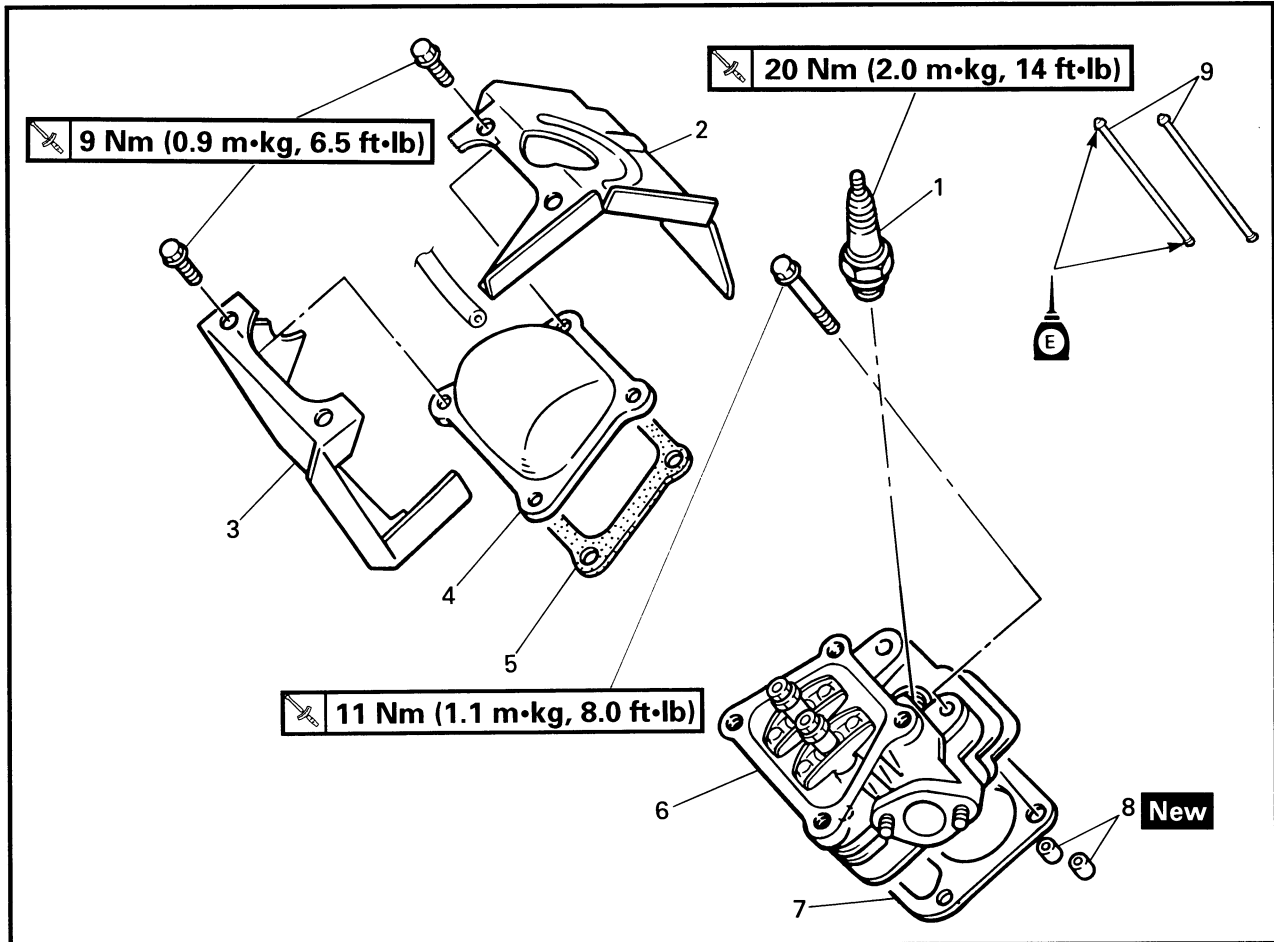


JOB INSTRUCTION CHART

Order	Job name/Parts name	Q'ty	Remarks
	Air filter, carburetor and control box removal		Remove the parts in the order below.
	Fuel tank		Refer to "MUFFLER PROTECTOR, FUEL TANK AND MUFFLER".
1	Breather hose	1	
2	Air filter assembly	1	
3	Gasket (air filter)	1	
4	Governor link rod	1	
5	Carburetor assembly	1	Refer to "CARBURETOR".
6	Gasket (carburetor)	1	
7	Joint	1	
8	Control box	1	NOTE: Disconnect the couplers and connectors, before control box removal. For installation, reverse the removal procedure.



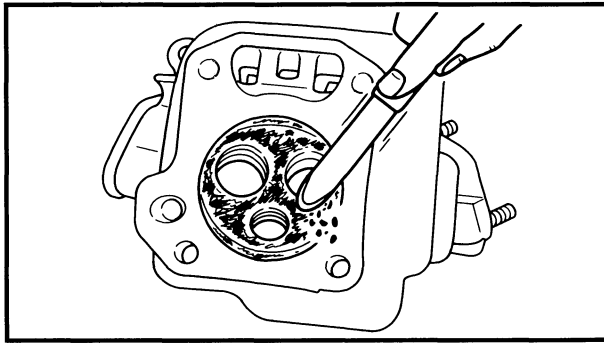
CYLINDER HEAD COVER AND CYLINDER HEAD



JOB INSTRUCTION CHART

Order	Job name/Parts name	Q'ty	Remarks
	Cylinder head cover and cylinder head removal		Remove the parts in the order below.
	Muffler protector , muffler and fuel tank		Refer to "MUFFLER PROTECTOR, FUEL TANK AND MUFFLER".
	Recoil starter		Refer to "RECOIL STARTER".
	Air filter and carburetor		Refer to "AIR FILTER".
1	Spark plug/Plug cap	1/1	
2	Air shroud upper	1	
3	Air shroud under	1	
4	Cylinder head cover	1/1	
5	Gasket (cylinder head cover)	1	
6	Cylinder head assembly	1	Refer to "Cylinder head installation".
7	Gasket (cylinder head)	1	
8	Dowel pins	1	
9	Push rods	1	
			For installation, reverse the removal procedure.

CYLINDER HEAD COVER AND CYLINDER HEAD



INSPECTION

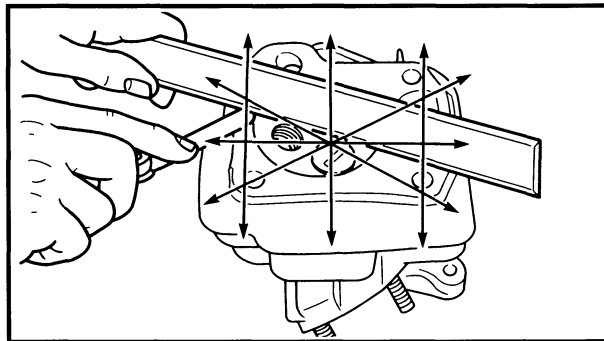
Cylinder head

1. Remove:
 - Carbon depositsUse a rounded scraper.

NOTE:

Be careful to the cylinder head inside when decarbonaizing.

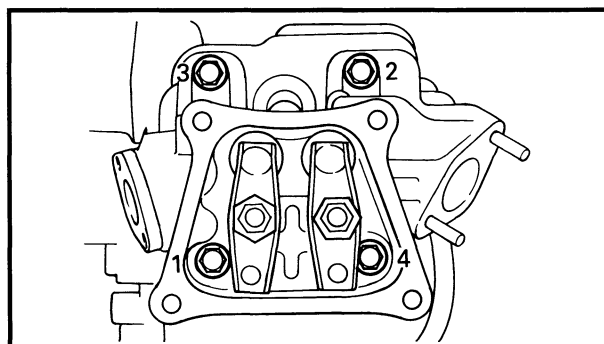
2. Inspect:
 - Cylinder headWear/Damage → Replace.



3. Measure:
 - Cylinder head warpageExceeds allowable limit → Replace.



Warpage limit:
0.1 mm (0.004 in)



INSTALLATION

1. Install:
 - Dowel pins
 - Cylinder head gasket **New**
 - Cylinder head assembly



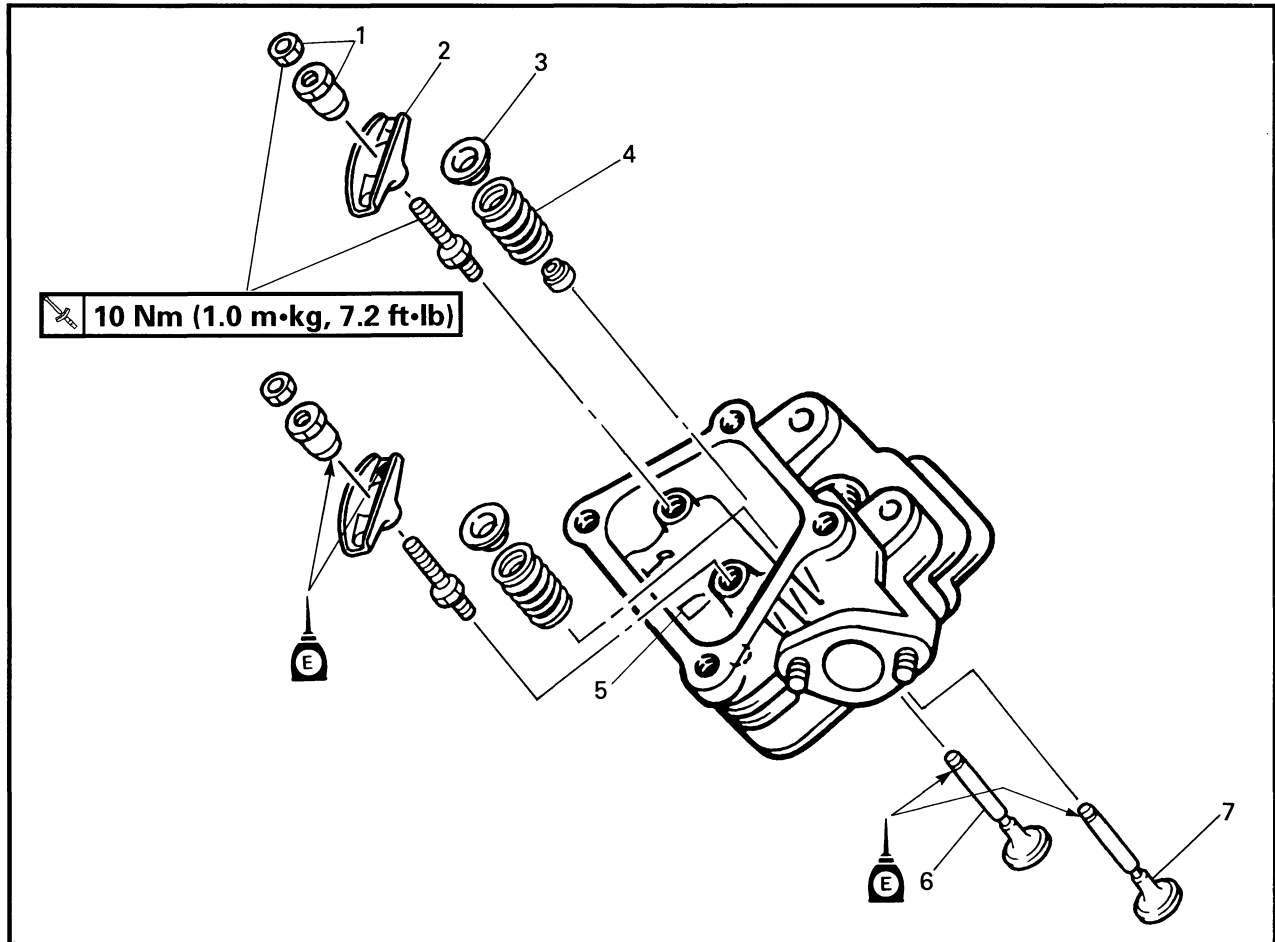
11 Nm (1.1 m•kg, 8.0 ft•lb)

NOTE:

Follow the tightening sequence.

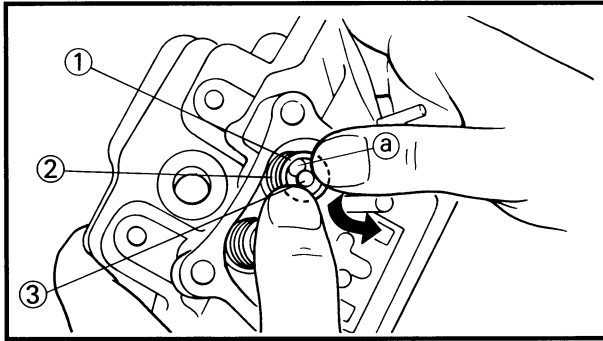


ROCKER ARMS, VALVES AND VALVE SPRINGS



JOB INSTRUCTION CHART

Order	Job name/Parts name	Q'ty	Remarks
	Rocker arms , valves and valve springs removal		Remove the parts in the order below. Refer to "CYLINDER HEAD".
1	Cylinder head assembly		
2	Locknuts/Adjusters	2/2	
3	Rocker arms	2	Refer to "Valve and valve spring installation".
4	Valve spring seats	2	
5	Valve springs	2	
6	Push rod guide	1	
7	Valve (intake)	1	
8	Valve (exhaust)	1	
			For installation, reverse the removal procedure.



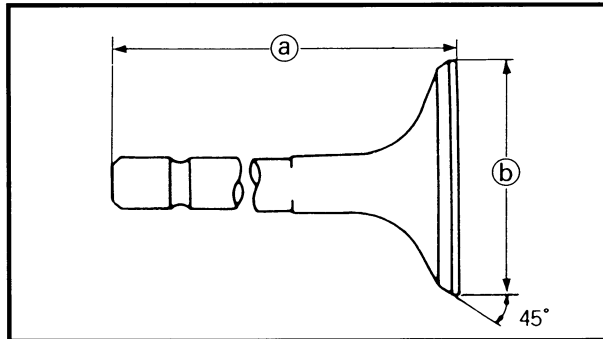
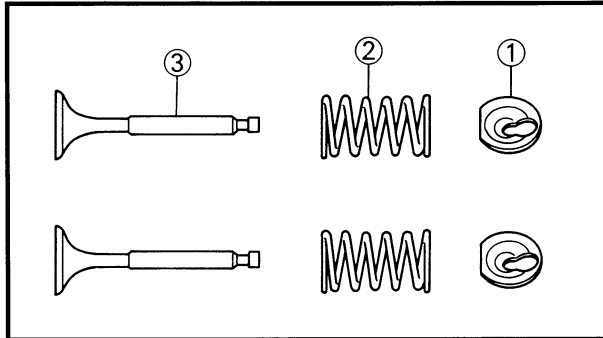
REMOVAL

1. Remove:

- Valve spring seat ①
- Valve spring ②
- Valve ③

NOTE:

Push and slide the valve spring seat so that the bigger hole ① of valve spring seat meshes with the valve stem end.



INSPECTION

Valve and valve spring

1. Measure:

- Valve length ①
- Valve face diameter ②

Use a dial gauge.

Out of specification → Replace.



Valve length:

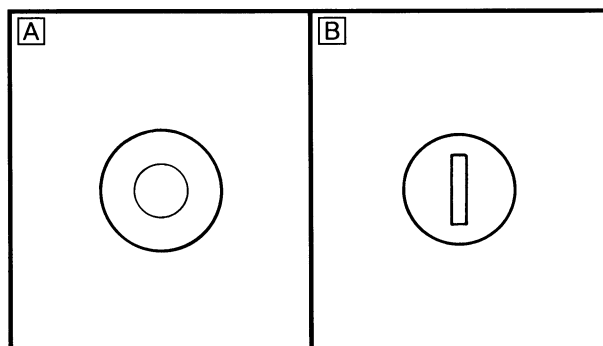
Intake: 53.4 mm (2.10 in)

Exhaust: 53.6 mm (2.11 in)

Valve face diameter:

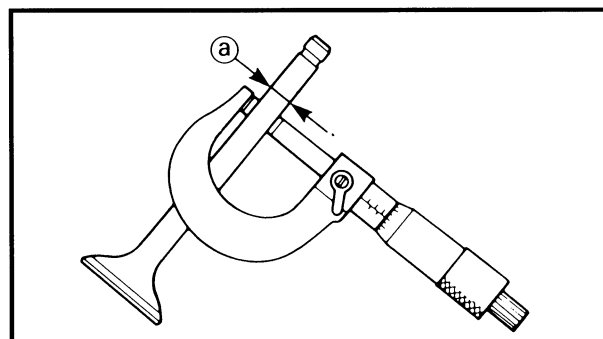
Intake: 19.0 mm (0.748 in)

Exhaust: 17.0 mm (0.669 in)



A Intake valve face:

B Exhaust valve face:



2. Measure:

- Valve stem diameter ①

Out of specification → Replace.



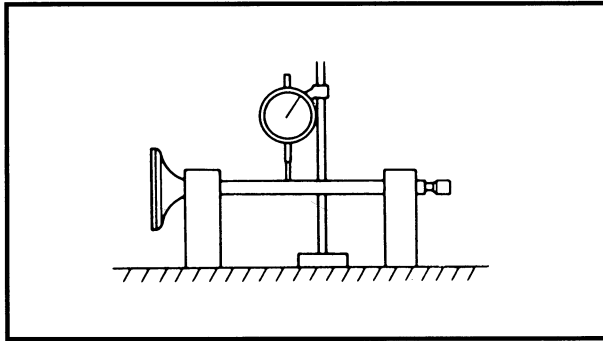
Valve stem diameter:

(Standard) 5.0 mm (0.196 in)

(limit)

Intake: 4.89 mm (0.192 in)

Exhaust: 4.87 mm (0.191 in)

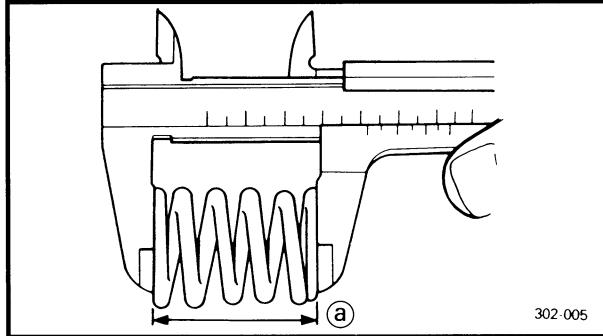


3. Measure:

- Valve stem bend
Out of specification→Replace.



Valve stem bend limit:
0.01 mm (0.0004 in)

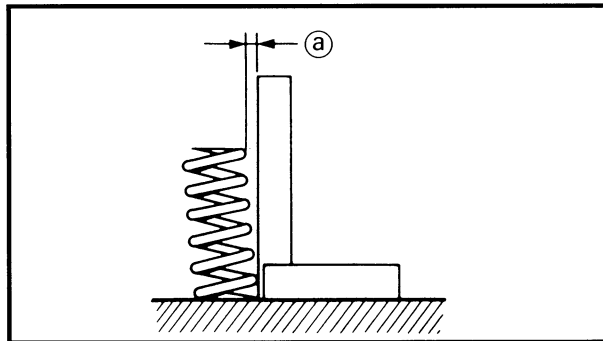


4. Measure:

- Valve spring free length (a)
Out of specification→Replace.



Valve spring free length:
27.4 mm (1.0787 in)
limit:
24.4 mm (0.9606 in)

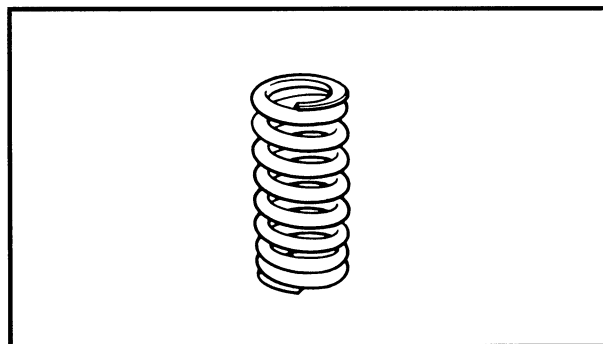


5. Measure:

- Valve spring tilt (a)
Use a square
Out of specification→Replace.

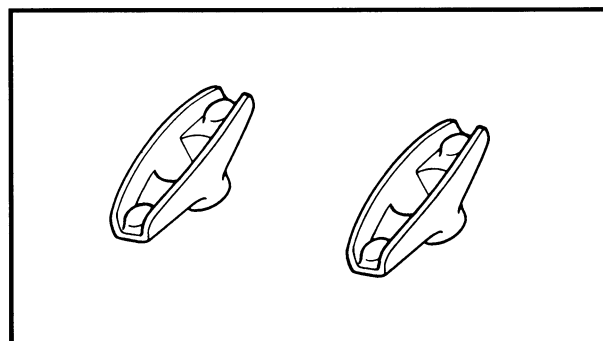


Valve spring tilt limit:
0.8 mm (0.03 in)



6. Measure:

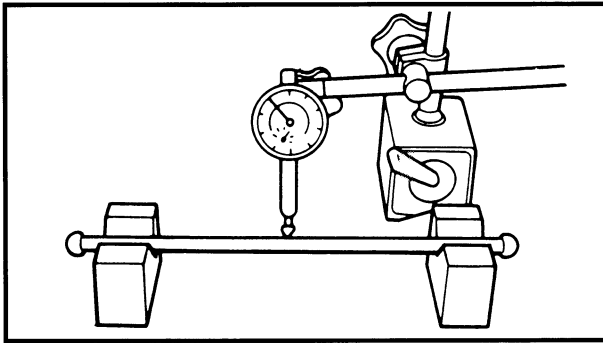
- Valve spring contact surface
Out of specification→Replace.



Rocker arm

1. Inspect:

- Rocker arm
Cracks/Ware/Damage→Replace.

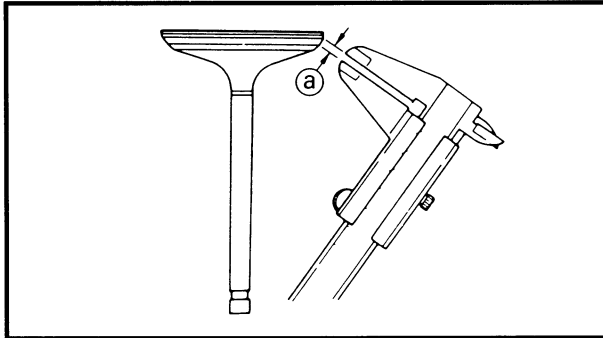


Push rod

1. Measure:
 - Push rod bend
 Roll on V-block
 Exceeds bending limit → Replace.



Push rod bend limit:
0.5 mm (0.02 in)

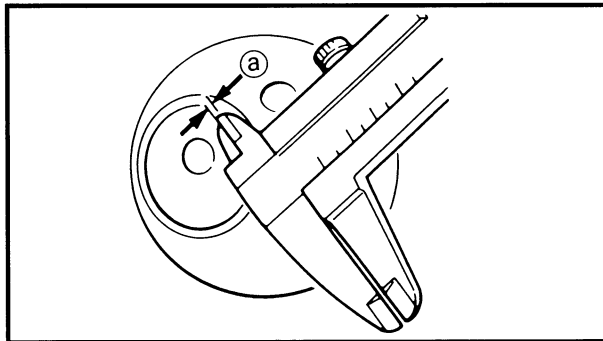


Valve seat

1. Decarbinaized to the valve face and valve seat.
2. Measure:
 - Valve contact width (a)
 Poor seating → Lap.



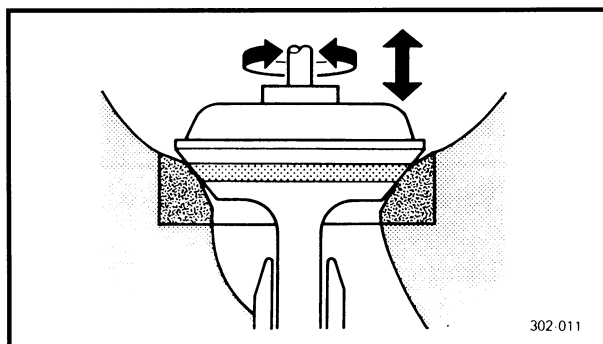
Valve contact with:
0.7 mm (0.027 in)
limit:
1.2 mm (0.047 in)



3. Measure:
 - Valve seat contact width (a)
 Poor seating → Lap.

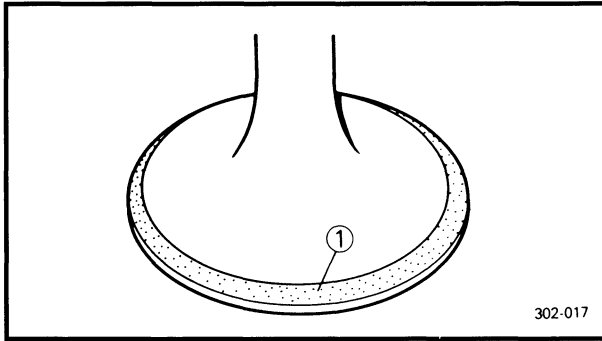


Valve seat contact with:
0.7 mm (0.027 in)
limit:
1.2 mm (0.047 in)



Valve seat assembly lapping

1. Apply:
 - Coarse lapping compound (a small amount to the valve face)
2. Position:
 - Valve (in the cylinder head)
3. Rotate:
 - Valve
 Turn until the valve and seat are evenly polished, then clean off the remaining compound.
4. Repeat the above steps with a fine compound and continue lapping until the valve face has a completely smooth surface.



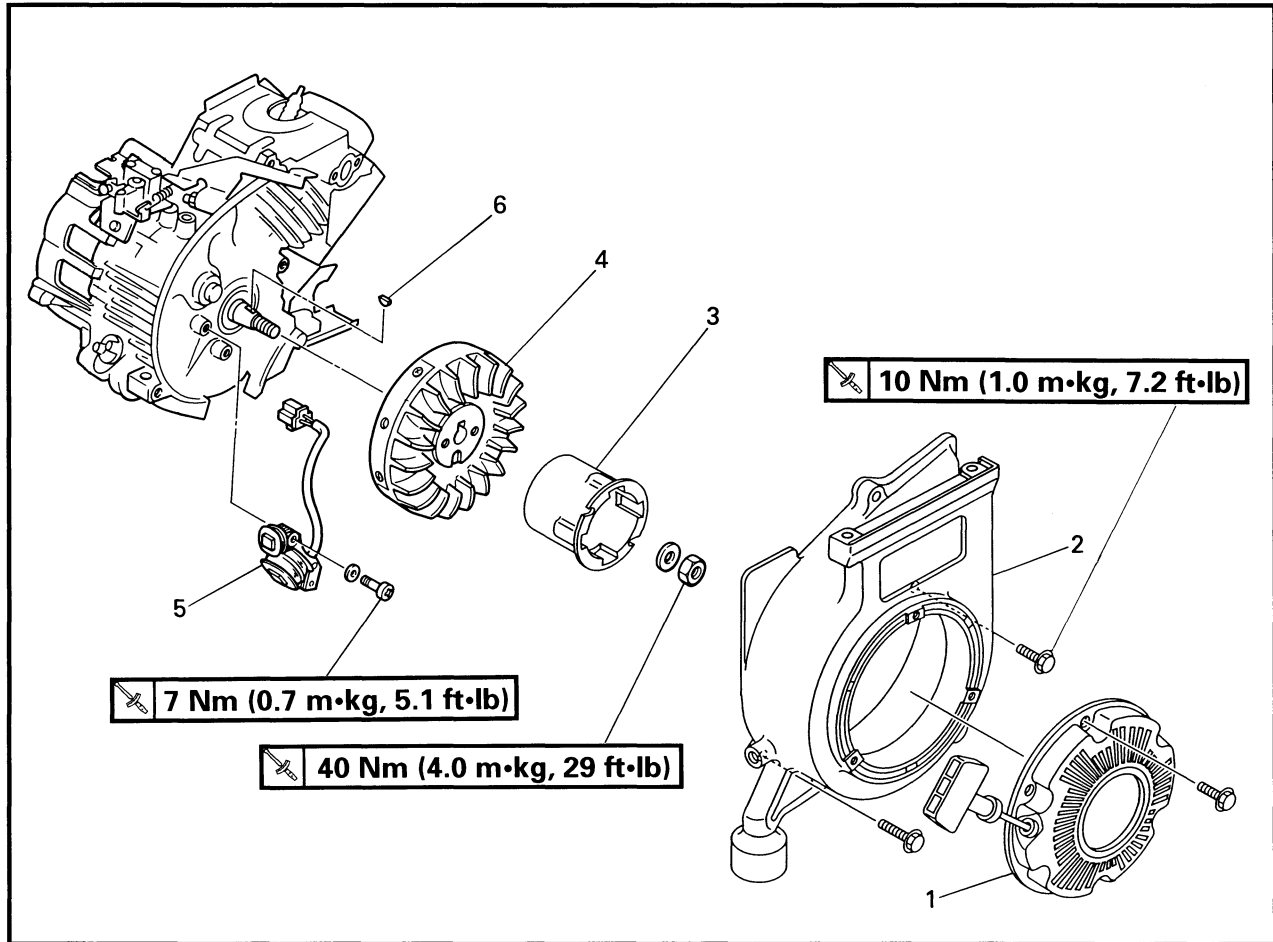
5. Remove:
 - Compound
(from the valve face)
6. Apply:
 - Mechanic's bluing dye (Dykem) ①
(to the valve face and seat)
7. Rotate:
 - Valve
The valve must make full seat contact. This is indicated by a gray surface all around the valve face where the bluing was removed.
8. Apply:
 - Solvent
(into each intake and exhaust port)
Leakage past valve seat → Repeat valve lapping until the seal is complete.

NOTE:

Pour the solvent into the intake and exhaust ports only after completion of all the valve work and assembly of the cylinder head.



RECOIL STARTER AND FLYWHEEL

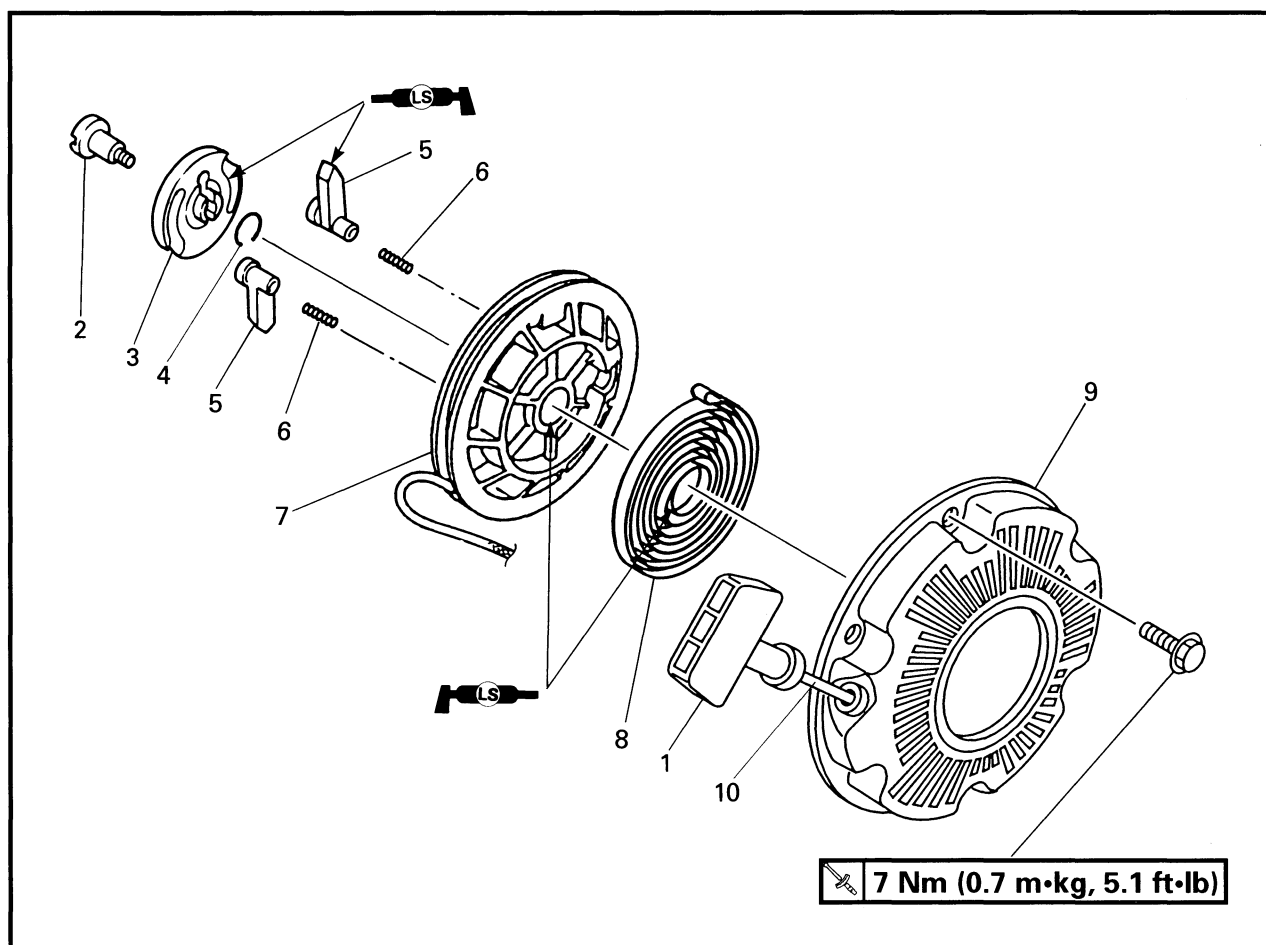


JOB INSTRUCTION CHART

Order	Job name/Parts name	Q'ty	Remarks
	Recoil starter and flywheel removal		
	Fuel tank		Remove the parts in the order below.
	Air filter assembly		Refer to "MUFFLER PROTECTOR, FUEL TANK AND MUFFLER".
	C.D.I. unit lead		Refer to "AIR FILTER AND CARBURETOR".
	Carburetor assembly		Refer to "ENGINE OVERHAUL".
	Link rod		Refer to "AIR FILTER AND CARBURETOR".
	Control box		
	Condenser lead		
1	Recoil starter assembly	1	
2	Front flame	1	
3	Starter pulley	1	
4	Flywheel	1	Refer to "Rotor disassembly and assembly".
5	Coil assembly	1	
6	Woodruff key	1	For installation, reverse the removal procedure.

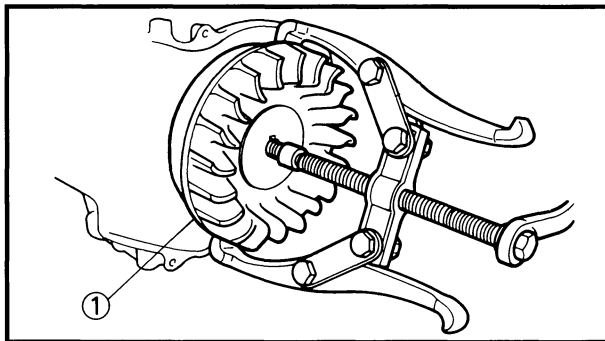


RECOIL STARTER



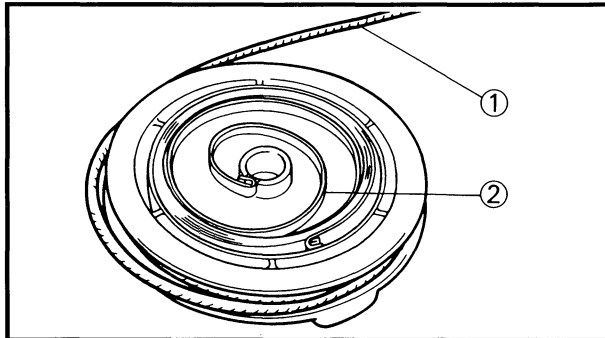
JOB INSTRUCTION CHART

Order	Job name/Parts name	Q'ty	Remarks
	Recoil starter disassembly		Disassembly the parts in the order below.
1	Starter handle	1	Refer to "Recoil starter assembly".
2	Screw	1	
3	Drive plate	1	
4	Clip	1	
5	Drive pawls	2	
6	Springs	2	
7	Sheave drum	1	
8	Starter spring	1	
			CAUTION:
			Be sure to the starter spring in the drum sheave. The spring will spread out suddenly when it is removed from the sheave drum
9	Starter case	1	For assembly, reverse the disassembly procedure.
10	Starter rope	1	



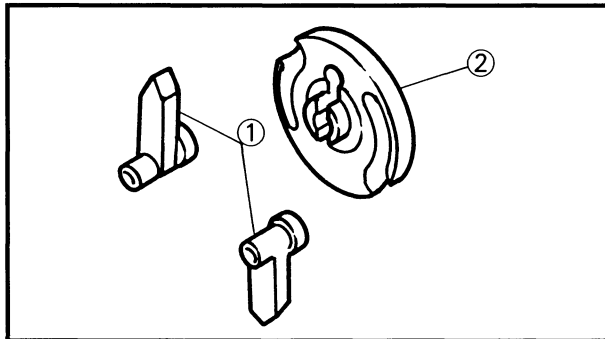
REMOVAL

1. Remove:
 - Flywheel ①
 Use a General bearing puller.

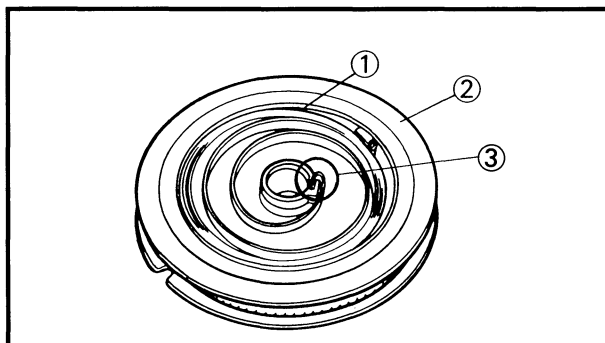


INSPECTION

1. Inspect:
 - Starter rope ①
 Wear/Damge→Replace.
2. Inspect:
 - Starter spring ②
 Contamination→Clean and apply grease.
 Wear/Damge→Replace.



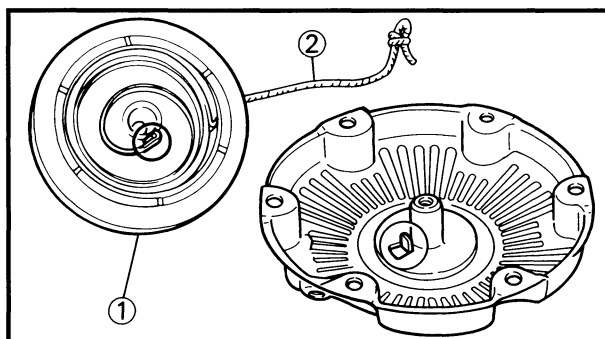
3. Inspect:
 - Drive pawl ①
 - Drive plate ②
 Wear/Damge→Replace.



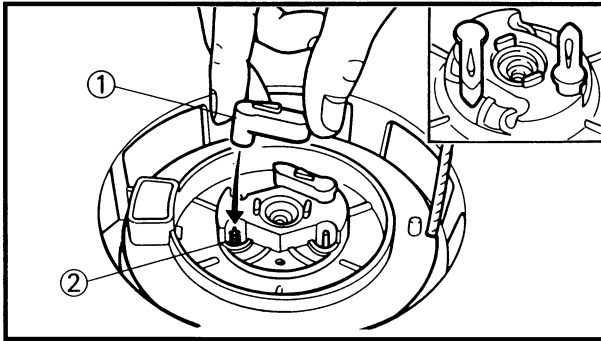
ASSEMBLY

1. Install:
 - Starter spring ①
 to the sheave drum ②

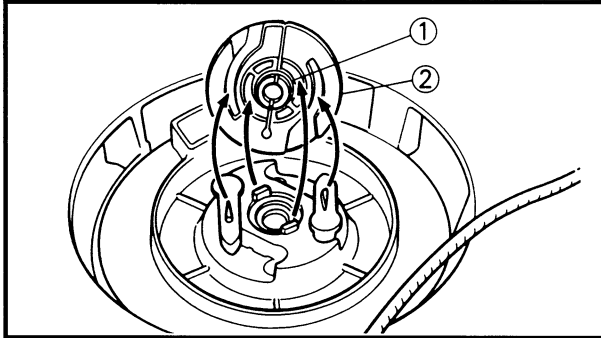
NOTE: Mesh the spring hook ③ with the drum slit, then wind the spring counter clockwise into the drum from larger to smaller diameter.



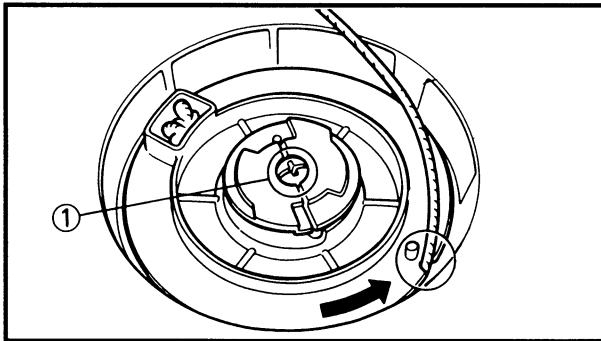
2. Install:
 - Sheave drum ①
 - Starter rope ②



3. Install:
- Drive pawl ①
 - Drive pawl spring ②



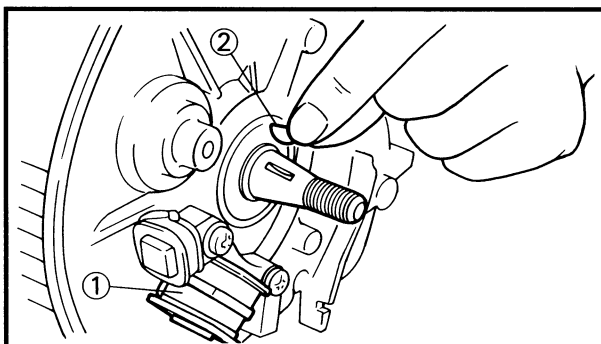
4. Install:
- Drive plate clip ①
 - Drive plate ②



5. Install:
- Screw ①

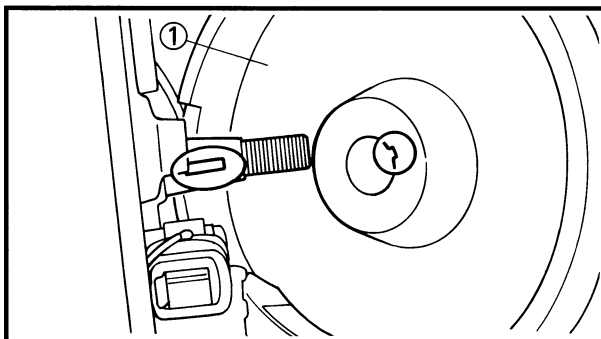
CAUTION:

Turn the drum sheave 4 turns counter clockwise to give spring preload.



Rotor assembly

1. Install:
- Coil assembly ①
 - Woodruff key ②



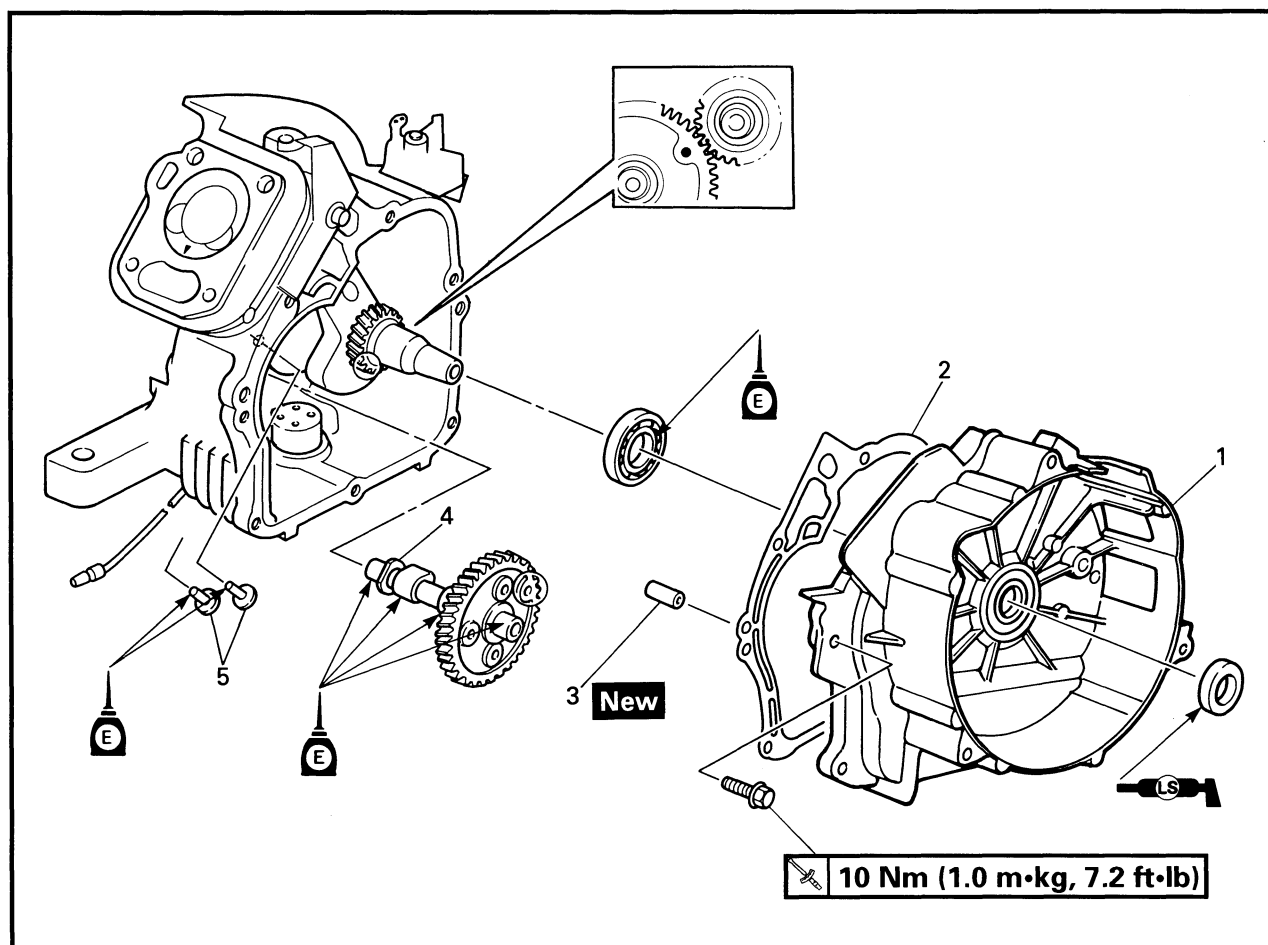
2. Install:
- Flywheel ①

NOTE:

Align the woodruff key with the slit on the rotor.

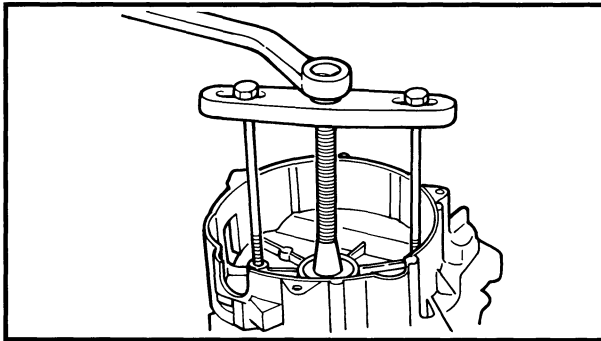


CRANKCASE COVER AND CAMSHAFT



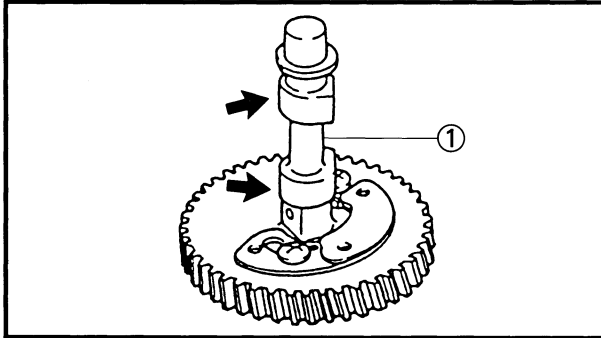
JOB INSTRUCTION CHART

Order	Job name/parts name	Q'ty	Remarks
	Crankcase cover and camshaft removal		Remove the parts in the order below.
	Engine oil		Refer to "ENGINE OIL REPLACEMENT" in chapter 3.
	Muffler and muffler protector		Refer to "MUFFLER PROTECTOR, FUEL TANK AND MUFFLER".
	Fuel tank and control box		Refer to "AIR FILTER AND CARBURETOR".
	Air filter assembly and carburetor assembly		
	Cylinder head		Refer to "CYLINDER HEAD".
	Recoil starter assembly and rotor assembly		Refer to "RECOIL STARTER AND FLYWHEEL".
1	Crankcase cover	1	
2	Gasket (crankcase cover)	1	Refer to "Crankcase cover installation".
3	Dowel pins	2	
4	Camshaft	1	
5	Valve lifter	2	Refer to "Camshaft installation". For installation, reverse the removal procedure.



REMOVAL

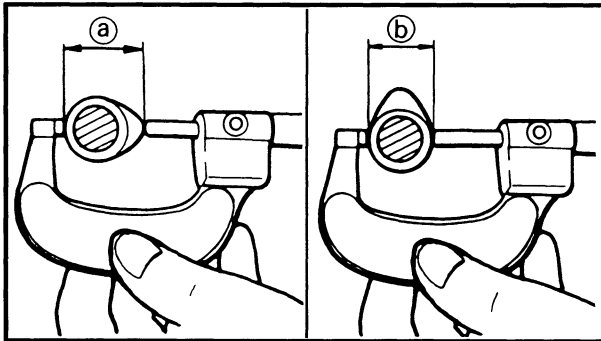
1. Remove:
 - Crankcase cover



INSPECTION

Camshaft

1. Inspect:
 - Camshaft ①
 - Wear/Damge→Replace.



2. Measure:
 - Cam lobes length ① and ②
 - Use a micro meter.
 - Out of specification→Replace.



Cam lobe length ①:

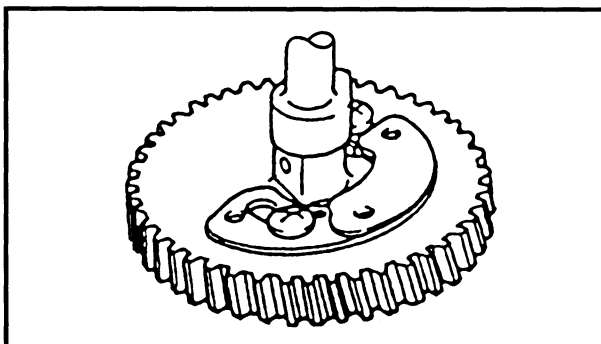
Intake: 20.5 ± 0.05 mm
(0.807 ± 0.002 in)

Exhaust: 20.5 ± 0.05 mm
(0.807 ± 0.002 in)

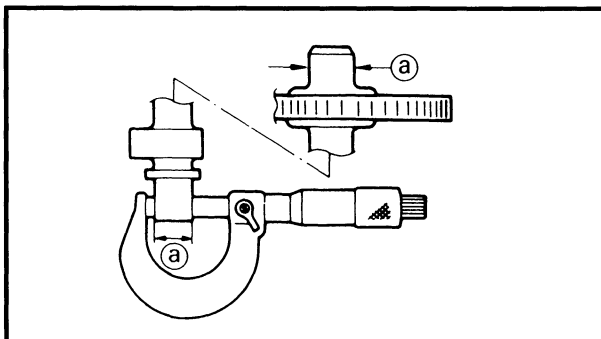
Cam lobe length ②:

Intake: 16.0 ± 0.05 mm
(0.63 ± 0.002 in)

Exhaust: 16.0 ± 0.05 mm
(0.63 ± 0.002 in)



3. Inspect:
 - Camshaft gear teeth
 - Wear/Damge→Replace.

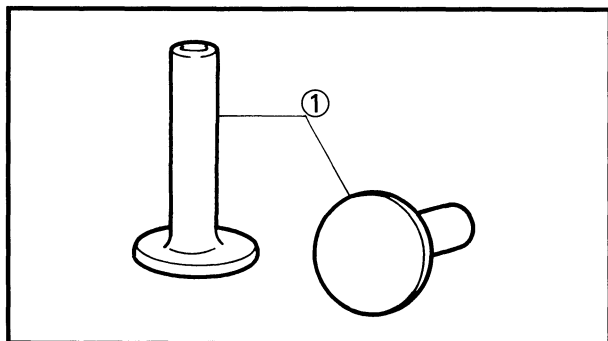


4. Measure:
 - Camshaft diameter ①
 - Out of specification→Replace.



Camshaft diameter (limit):

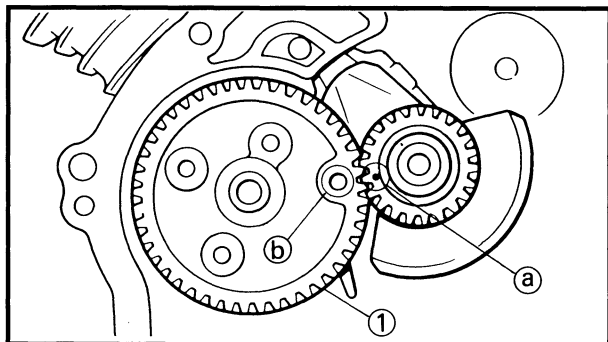
15.95 mm (0.6280 in)



Valve lifter

1. Inspect:

- Valve lifter ①
Wear/Damge→Replace.



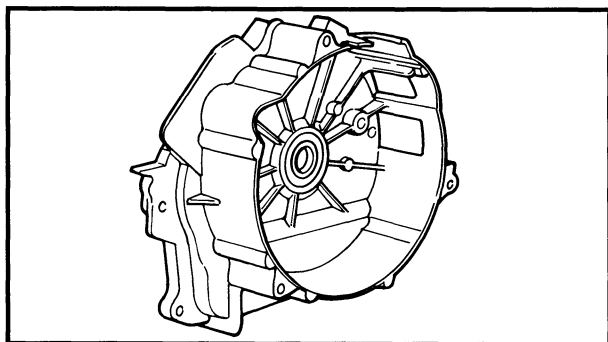
Camshaft installation

1. Install:

- Camshaft ①

NOTE:

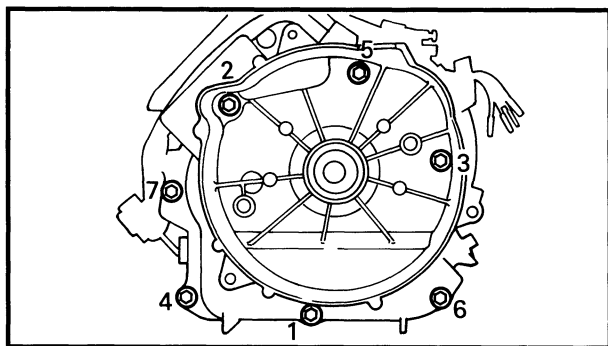
Be sure to align the camshaft gear mark ① with the crankshaft gear mark ②.



Crankcase cover

1. Inspect:

- Crankcase cover
Wear/Damge→Replace.
- Bearings
Damage/Roughness→Replace.



Crankcase cover installation

1. Install:

- Dowel pins
- Gasket (crankcase cover) **New**
- Crankcase cover

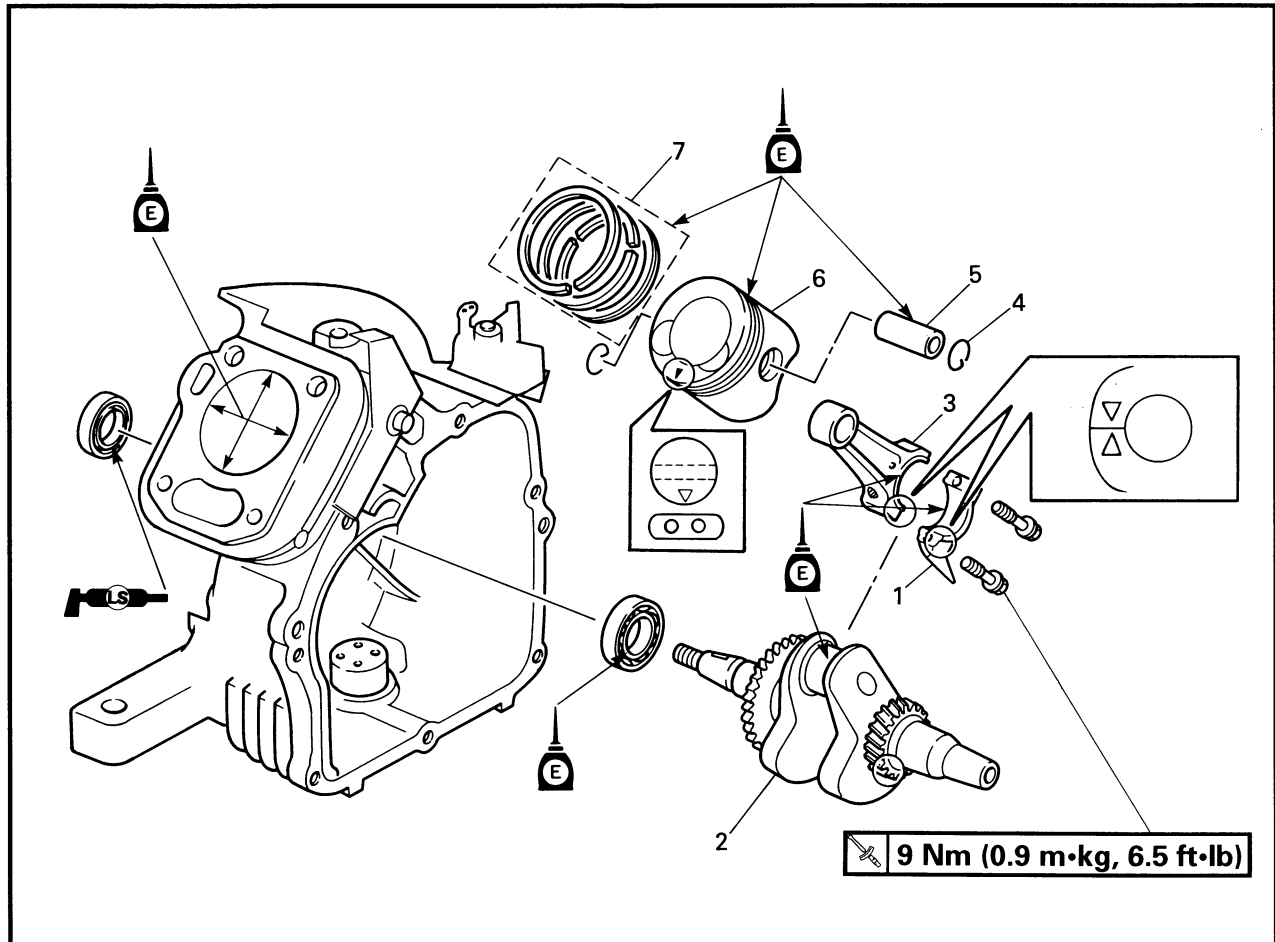
10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

Follow proper tightening sequence.

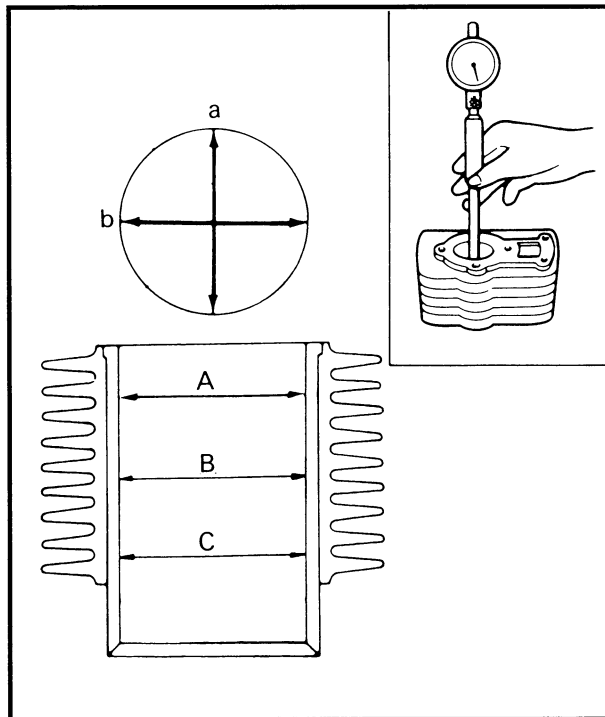


PISTON, CONNECTING ROD, CRANKSHAFT AND CRANKCASE



JOB INSTRUCTION CHART

Order	Job name/parts name	Q'ty	Remarks
	Piston, connecting rod and crankshaft removal		Remove the parts in the order below.
	Rotor assembly		Refer to "RECOIL STARTER AND FLYWHEEL".
	Camshaft		Refer to "CRANKCASE COVER AND CAMSHAFT".
1	Connecting rod cap	1	Refer to "Connecting rod and crankshaft installation".
2	Crankshaft assembly	1	
3	Connecting rod	2	Refer to "Connecting rod and crankshaft installation".
4	Piston pin circlip	1	
5	Piston pin	1	For installation, reverse the removal procedure.
6	Piston	1	
7	Piston rings	3	



INSPECTION

Crankcase (cylinder)

1. Measure:

- Cylinder inside diameter

Use a cylinder gauge.

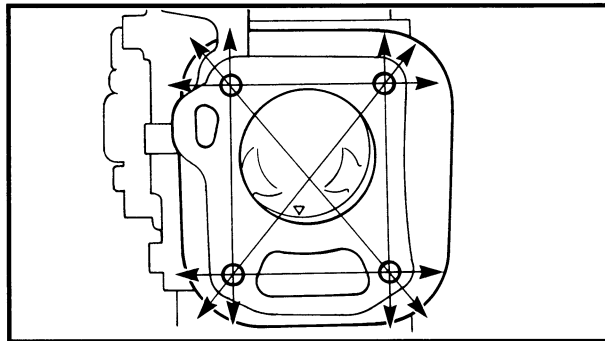
Out of specification → Rebore the cylinder, and replace the piston and piston rings.

NOTE:

Take side to side and front to back measurements at each of the 3 rotations (total of 6 measurements). Then, find the average of the measurements.

D = Maximum A, B, C

T = Maximum A - Minimum C



2. Inspect:

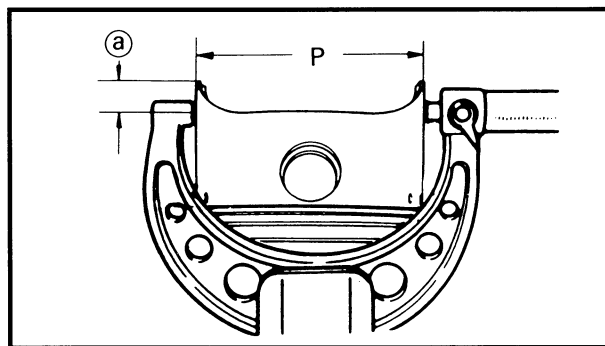
- Cylinder wrappage

Out of specification → Replace



Wrappage limit:

0.05 mm (0.002 in)



Piston and piston pin

1. Measure:

- Piston diameter (P)

Ⓐ = 10 mm (0.3937 in) from the bottom edge of the piston.



Standard piston size:

50.0 mm (1.968 in)

Piston wear limit:

49.93 mm (1.965 in)

2. Calculate:

- Piston clearance

Piston clearance =
Cylinder inside diameter "D" —
Piston skirt diameter "P"

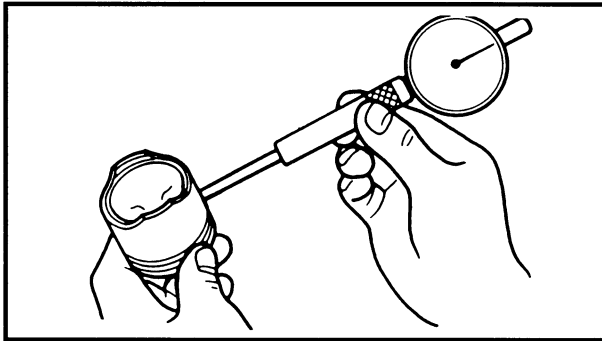
Out of specification → Rebore the cylinder and replace the piston and piston rings.



Piston clearance:

0.020 ~0.035 mm

(0.00078 ~0.00137 in)



3. Measure:

- Piston pin hole inside diameter

Use a micrometer.

Out of specification→Replace.

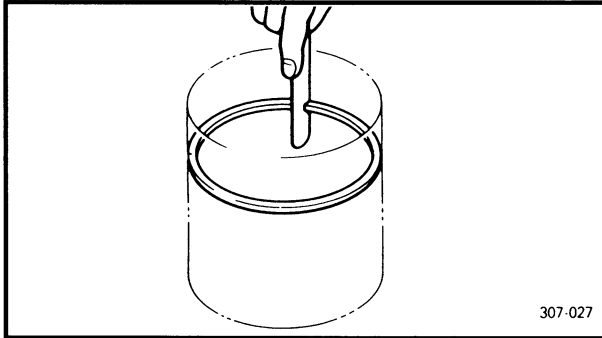


Standard diameter:

12.0 mm (0.4724 in)

Piston pin wear limit:

11.95 mm (0.470 in)



307-027

Piston rings

1. Measure:

- Piston ring end gap

Use a thickness gauge.

Out of specification→Replace.

NOTE:

You can not measure end gap on expander spacer of oil control ring. If control ring rails show excessive gap, replace all three rings.



Piston ring end gap:

Top ring:

0.1 ~ 0.25 mm

(0.004 ~ 0.01 in)

2nd ring:

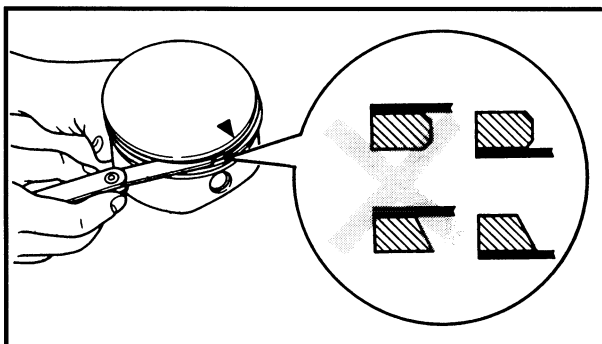
0.1 ~ 0.25 mm

(0.004 ~ 0.01 in)

Oil ring:

0.2 ~ 0.4 mm

(0.008 ~ 0.015 in)



2. Measure:

- Piston ring side clearance

Use a thickness gauge.

Out of specification→Replace.

NOTE:

Clean carbon from piston ring grooves and rings before measuring side clearance.



Piston ring side clearance:

Top ring:

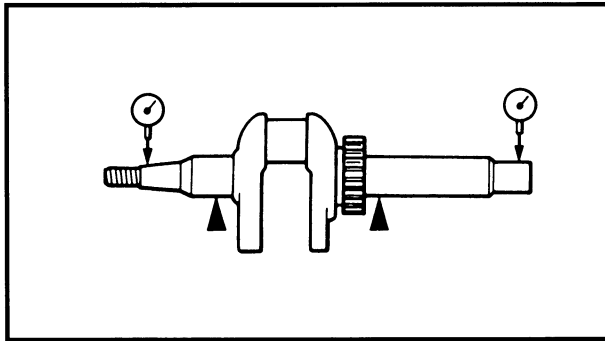
0.06 mm

(0.002 in)

2nd ring:

0.04 mm

(0.001 in)



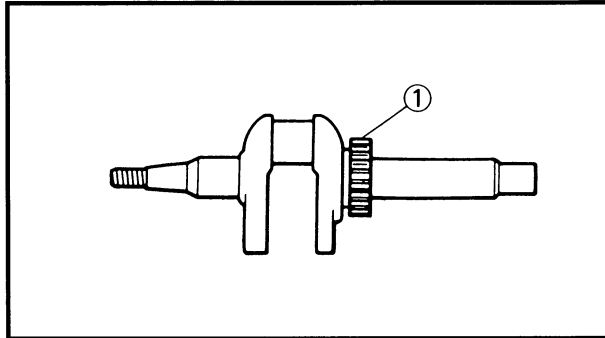
Crankshaft

1. Measure:

- Crankshaft runout
Use a dial gauge.
Out of specification→Replace.

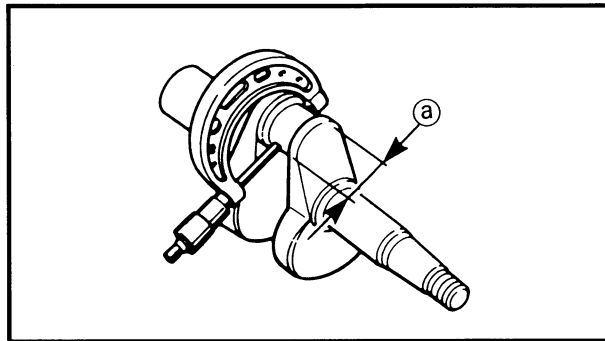


Crankshaft runout:
0.02 mm (0.0008 in)



2. Inspect:

- Crankshaft sprocket teeth ①
Wear/Damage→Replace.

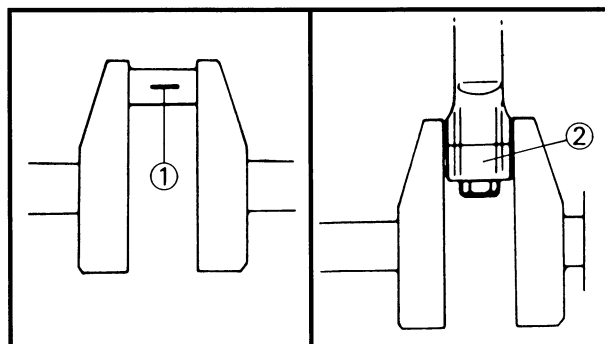


3. Measure:

- Crankpin outside diameter ①
Use a micrometer.
Out of specification→Replace.



Crankpin outside diameter:
22.0 mm (0.866 in)
Wear limit:
21.9 mm (0.862 in)

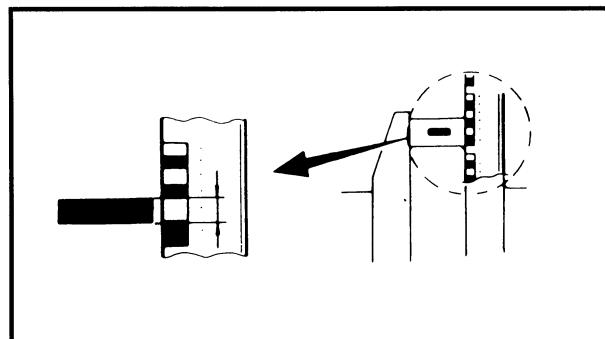


4. Measure:

- Oil clearance
Use Plastigauge®.
Out of specification→Replace the connecting rod.



Oil clearance:
0.016 ~ 0.034 mm
(0.00063 ~ 0.00134 in)
Oil clearance limit:
0.1 mm (0.00157 in)

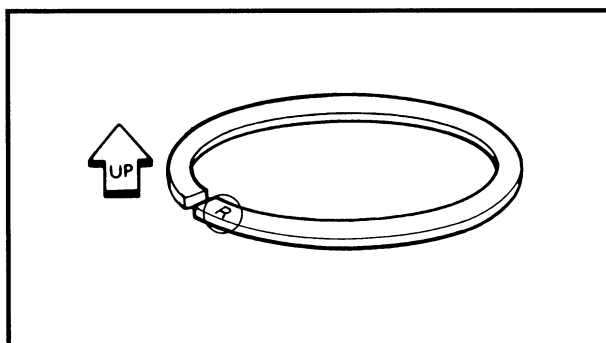


Oil clearance measurement steps:

1. Thoroughly clean all of the parts.
2. Place plastigauge® ① onto the crankpin.
3. Install the connecting rod and cap ② onto the crankcase.
4. Torque both cap bolts evenly.



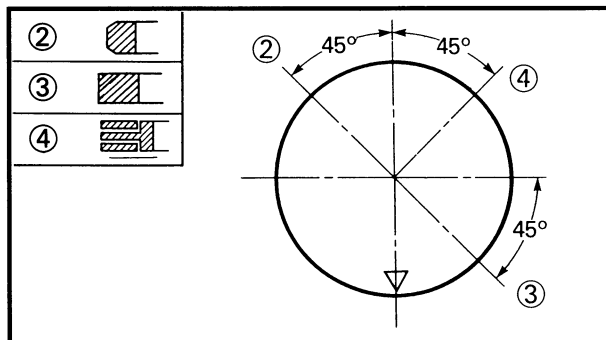
9 Nm (0.9 m•kg, 6.5 ft•lb)



5. Remove the connecting rod and measure the plastigauge R with.

NOTE:

Do not move the crankshaft until the oil clearance measurement has been completed.



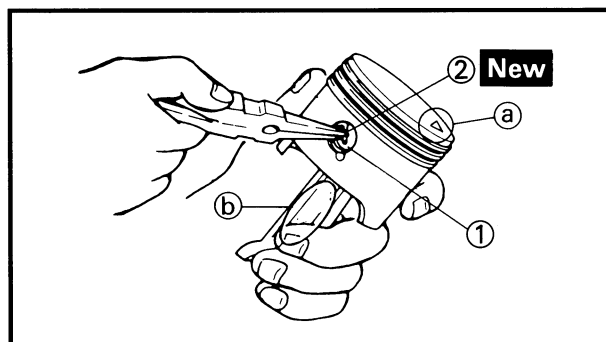
Piston rings and piston installation

1. Install:

- Top ring ②
- 2nd ring ③
- Oil ring ④

CAUTION:

- Be sure to install the second ring so that the manufacturers mark ① faces towards the piston head.
- Make sure that the end gap of each piston ring is positioned, as shown in the illustration.

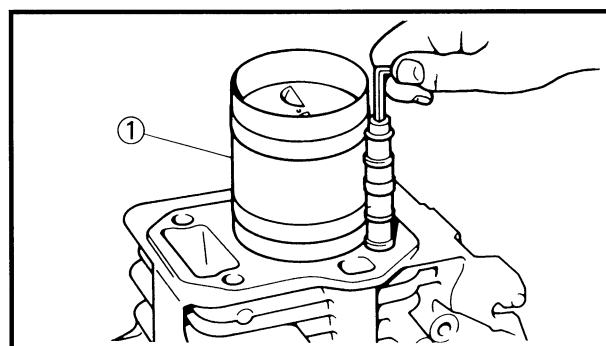


2. Install:

- Piston pin ①
- Piston pin circlips ② **New**

CAUTION:

Make sure that the "PTO" (b) mark on the connecting rod faces the left side when the piston head "V" (a) mark down ward.



3. Install:

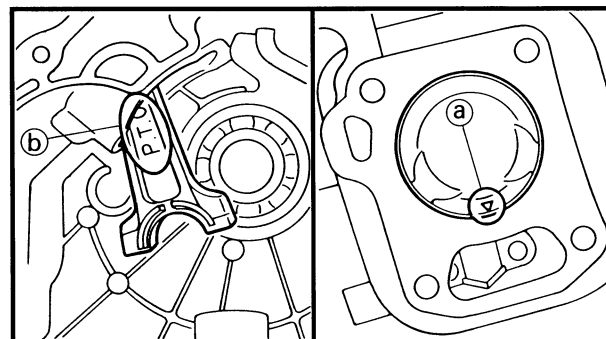
- Piston
- Use a piston pin compressor ①.

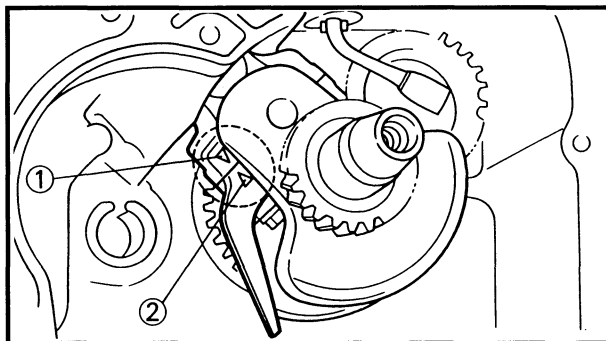


Piston ring compressor:
YU-33294 (90890-05158)

CAUTION:

- Make sure that the "P.T.O." (b) mark on the connecting rod faces with your side, when install the piston.
- Make sure that the piston head "V" (a) mark down ward (push rod side).





4. Install:

- Connecting rod cap

 **9 Nm (0.9 m•kg, 6.5 ft•lb)**

CAUTION:

Make sure that the "∇" rod mark ① is aligned with the "∇" cap mark ② .

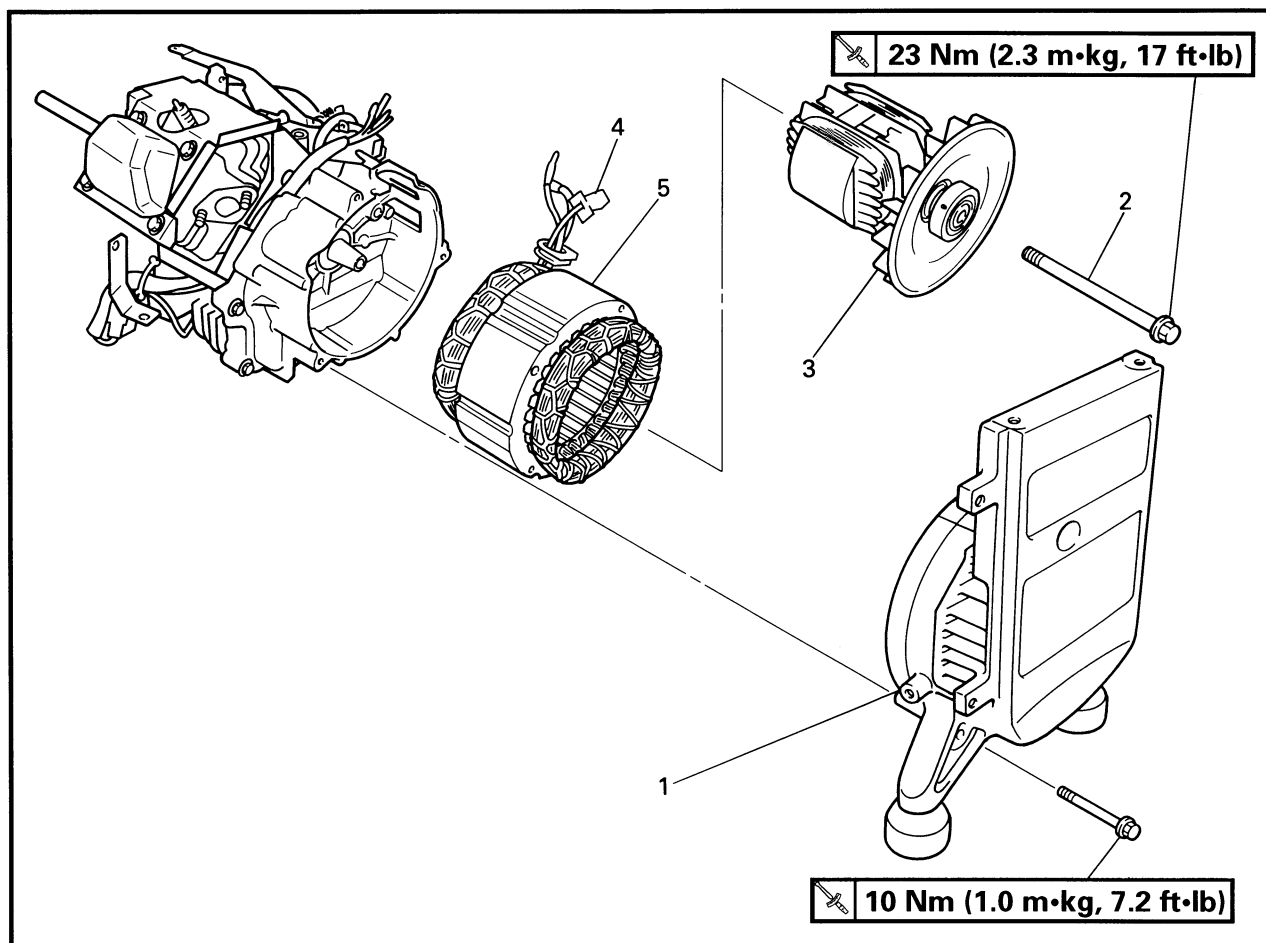
5. Install:

- Camshaft
- Dowel pins
- Gasket (crankcase cover)
- Crankcase cover

Refer to "CRANKCASE COVER AND CAMSHAFT" section.

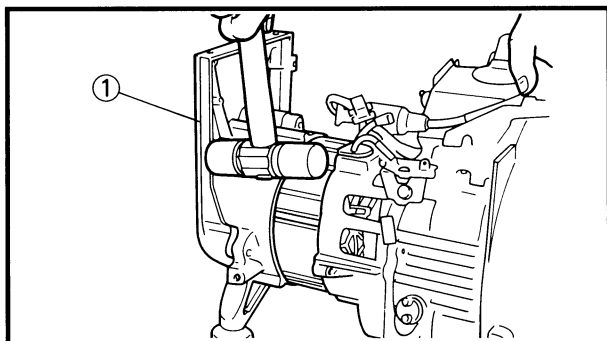


GENERATOR



JOB INSTRUCTION CHART

Order	Job name/parts name	Q'ty	Remarks
1	Generator removal Muffler assembly Fuel tank Recoil starter assembly Rear flame	1	Remove the parts in the order below. Refer to "FUEL TANK AND MUFFLER". Refer to "RECOIL STARTER AND FLYWHEEL". Refer to "CRANKCASE COVER AND CAMSHAFT".
2	Rotor bolt	1	NOTE: When remove rotor bolt, make sure add the stopper to the flywheel.
3	Rotor assembly	1	
4	Coupler	1	
5	Stator assembly	1	
			For installation, reverse the removal procedure.

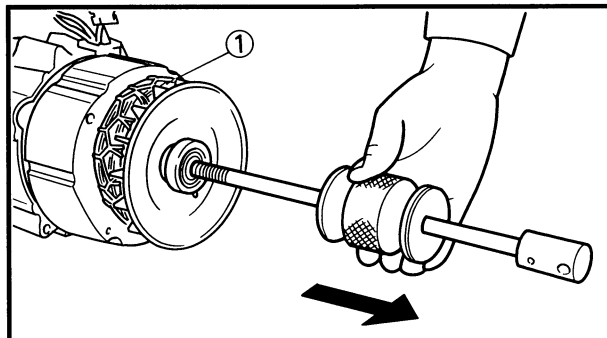


REMOVAL

1. Remove:
 - Rear flame ①

NOTE:

When remove the rear flame, use a soft hammer to rightly touch.



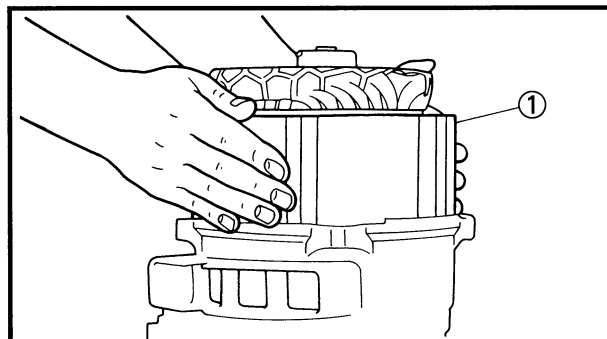
2. Remove:
 - Rotor assembly ①



Rotor shock puller set:
YU-1047

CAUTION:

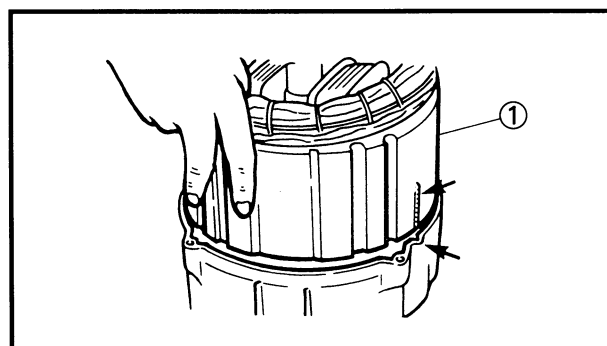
Take care the rotor assembly for removal.



3. Remove:
 - Stator assembly ①

CAUTION:

Take care the stator assembly for removal.

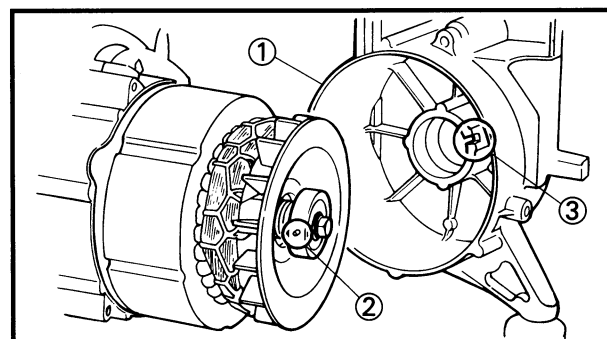


INSTALLATION

1. Install:
 - Stator assembly ①

NOTE:

Align the key ① on the stator assembly with the slot ② on the crankcase cover.



2. Install:
 - Rear flame ①

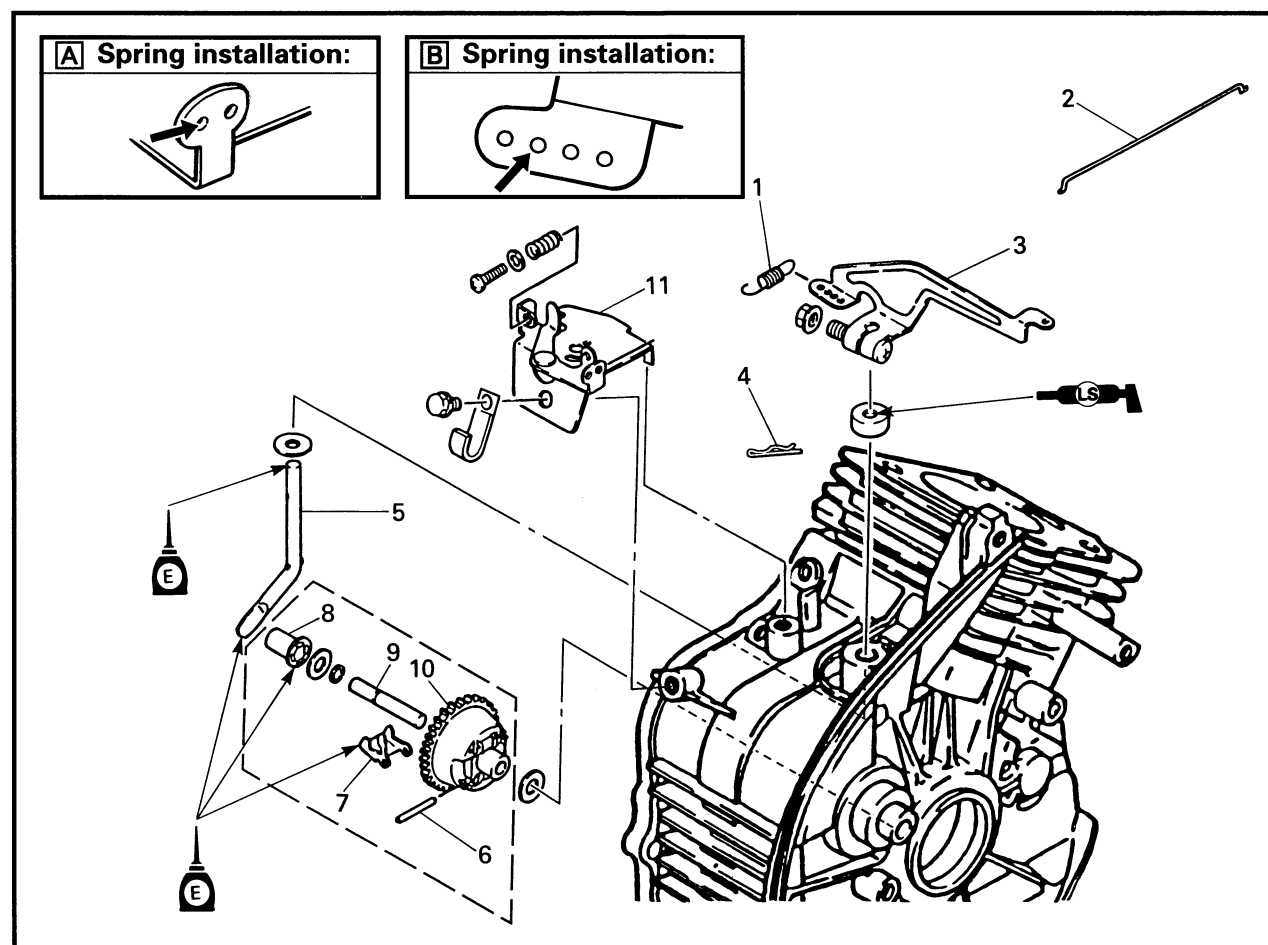
10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

Align the pin ② on the rotor bearing with the slot ③ on the rear flame.

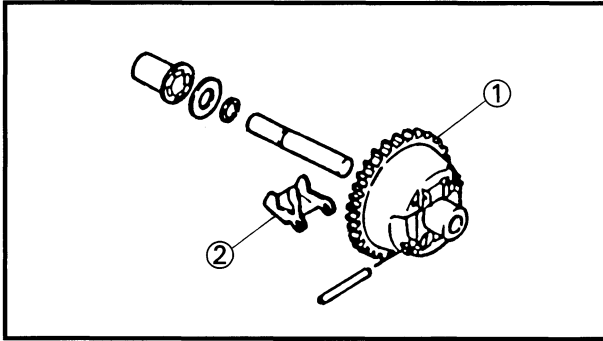


GOVERNOR



JOB INSTRUCTION CHART

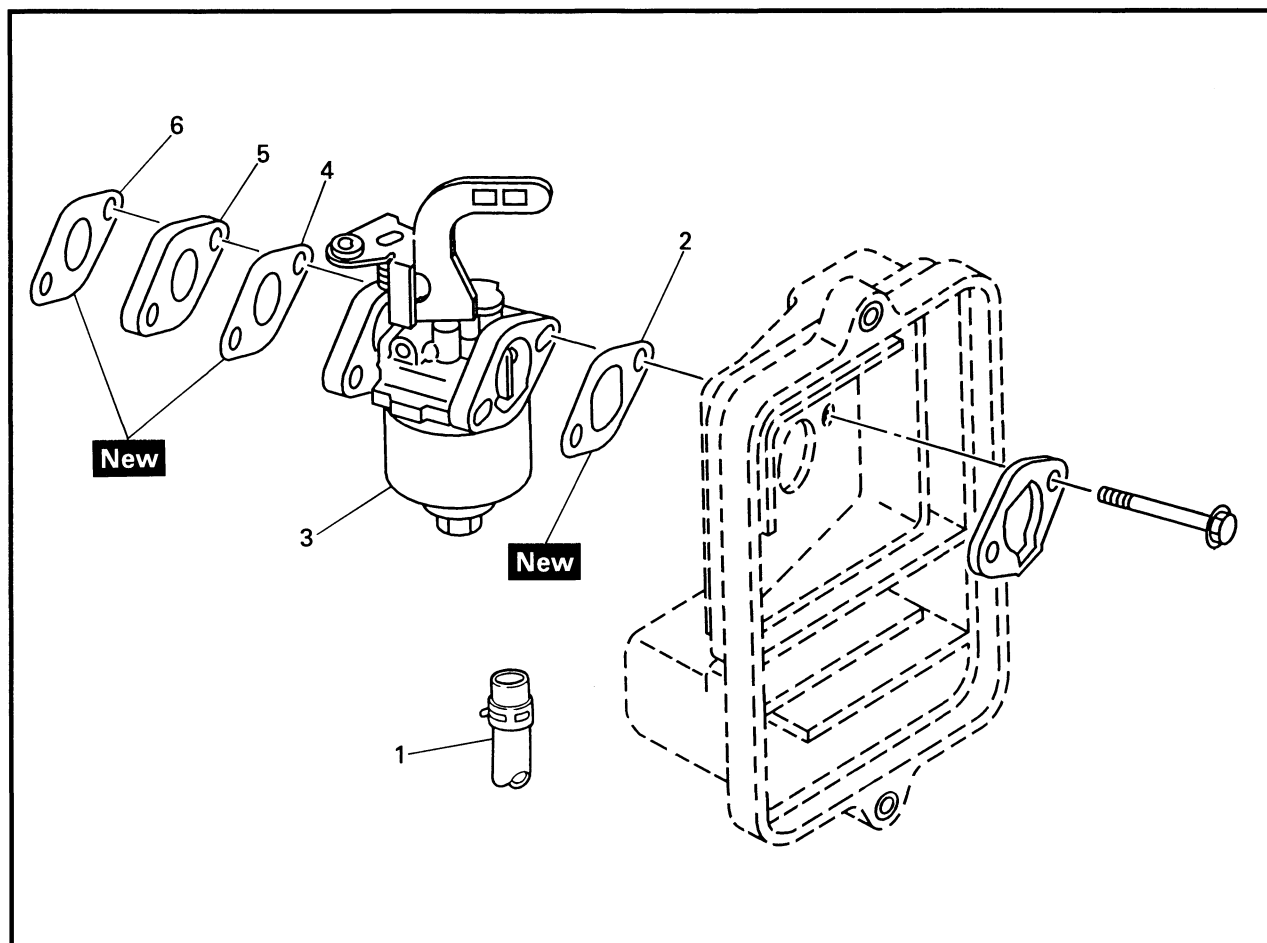
Order	Job name/parts name	Q'ty	Remarks
	Governor removal		Remove the parts in the order below.
	Fuel tank		Refer to "FUEL TANK AND MUFFLER".
	Generator		Refer to "GENERATOR".
	Crankshaft		Refer to "CRANKCASE COVER AND CAMSHAFT".
1	Spring	1	
2	Link rod	1	
3	Governor arm	1	
4	Clip	1	
5	Governor fork	1	
6	Pin	2	
7	Weight	2	
8	Collar	1	
9	Shaft	1	
10	Weight gear	1	
11	Adjusting plate assembly	1	
			For installation, reverse the removal procedure.

**INSPECTION**

1. Inspect:
 - Weight gear ①
Cracks/Wear/Damge→Replace.
2. Inspect:
 - Weight ②
Vend/Damge→Replace.



CARBURETOR

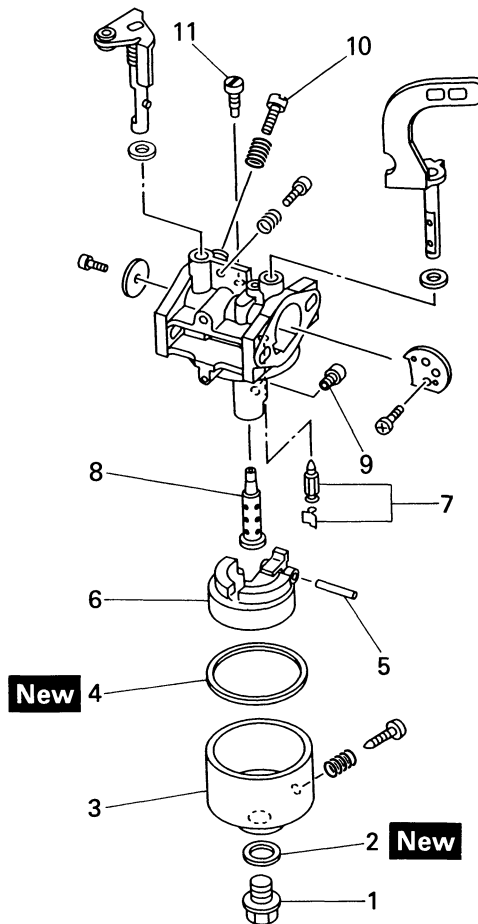
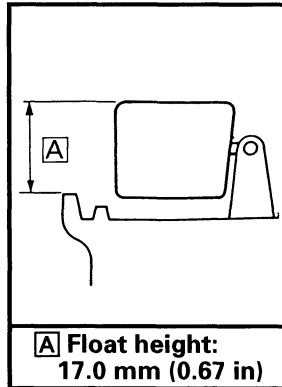


JOB INSTRUCTION CHART

Order	Job name/parts name	Q'ty	Remarks
	Carburetor removal		
	Air filter assembly		
1	Fuel hose		Remove the parts in the order below. Refer to "Fuel tank and air filter removal " in chapter 3. NOTE: Before disconnect the fuel hose, turn the fuel petcock position to the "C" position.
2	Gasket (air filter)		
3	Carburetor assembly	1	
4	Gasket (carburetor)	1	
5	Joint (carburetor)	1	
6	Gasket (intake)	1	
			For installation, reverse the removal procedure.

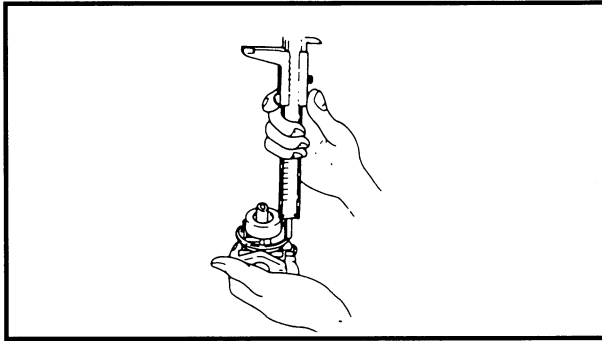


	EF1000A
Type	BV15
I.D. Mark	7TA10
Float height	17.0 mm



JOB INSTRUCTION

Order	Job name/parts name	Qté	Remarks
	Carburetor disassembly		
1	Bolt	1	Disassembly the parts in the order below. For assembly, reverse the disassembly procedure.
2	Gasket	1	
3	Float chamber	1	
4	Gasket (float chamber)	1	
5	Float pin	1	
6	Float	1	
7	Needle/clip	1/1	
8	Main nozzle	1	
9	Main Jet	1	
10	Pilot screw	1	
11	Pilot jet	1	



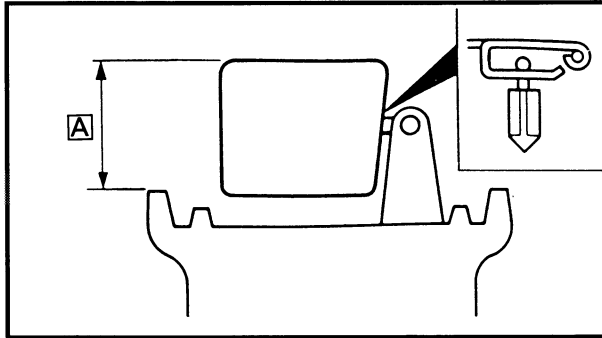
INSPECTION

1. Measure:
 - Float height

NOTE:

Place the carburetor in an inverted position for measuring.

Lift up the float so that the tip of the float valve lightly contacts the float arm, and measure the float height. (This measurement should be made with the gasket removed.)

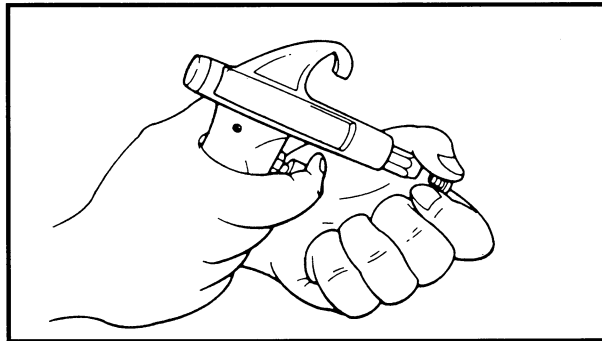


Float height [A]:
17.0mm (0.67 in)

Out of specification → Replace.

2. Inspect:
 - Carburetor body
 - Fuel passage

Contamination → Clean as indicated.

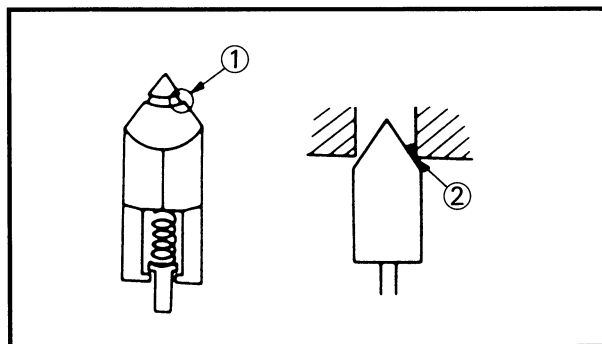


Carburetor cleaning steps:

- Wash the carburetor in a petroleum based solvent. (Do not use a caustic carburetor cleaning solution.)
- Blow out all of the passages and jets with compressed air.

CAUTION:

Never use a wire to clean the passage or jets.

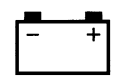


3. Inspect:
 - Valve seat

Wear/Damage → Replace.

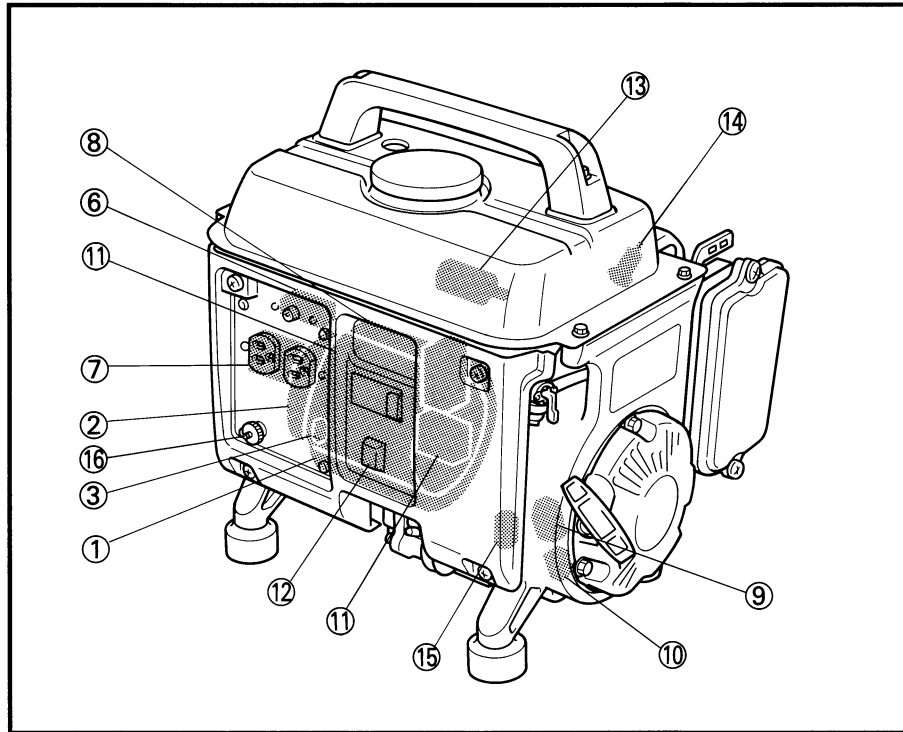
Contamination → Clean .

- ① Grooved wear
- ② Dust



ELECTRICAL

ELECTRICAL COMPONENTS

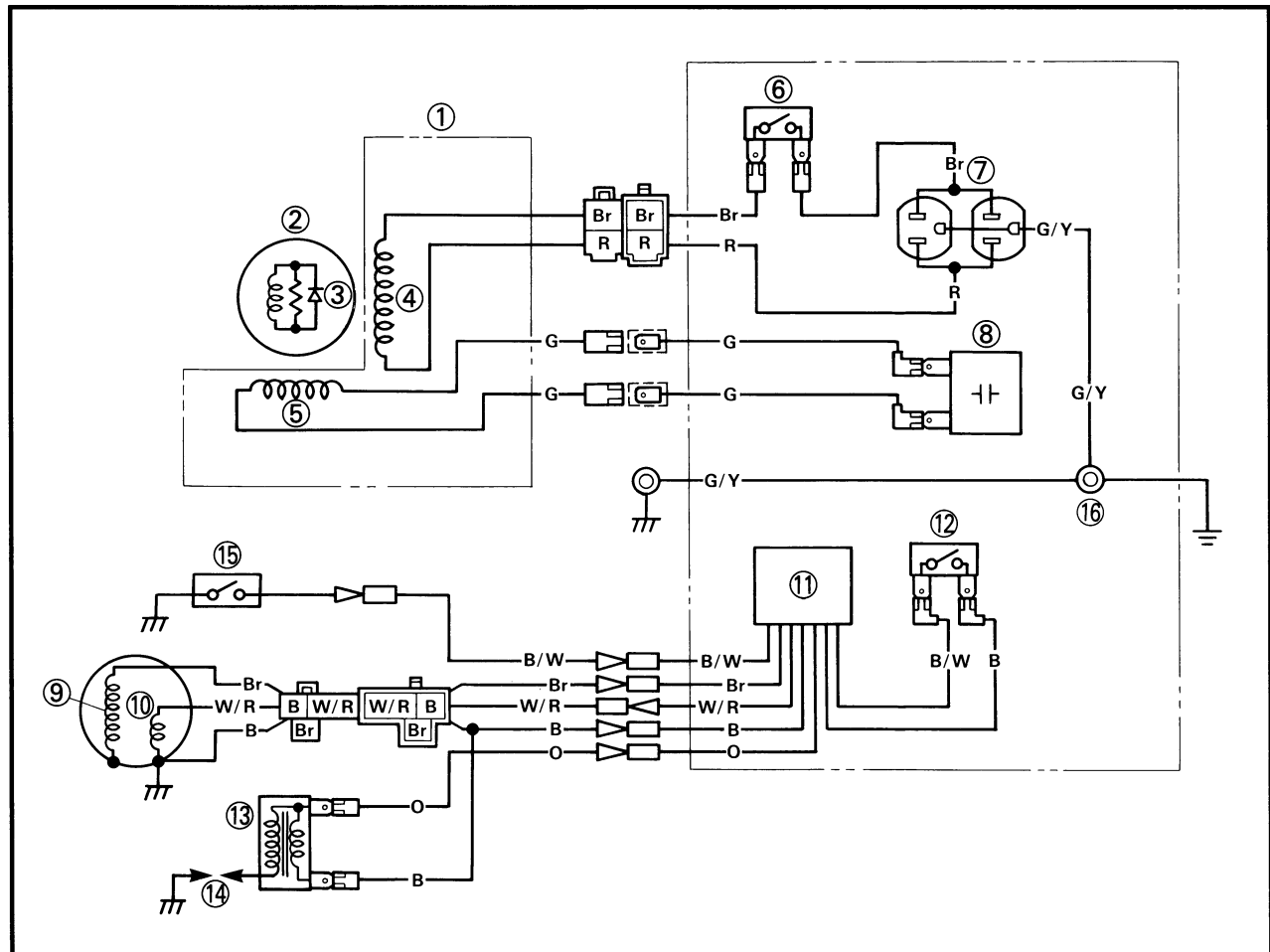


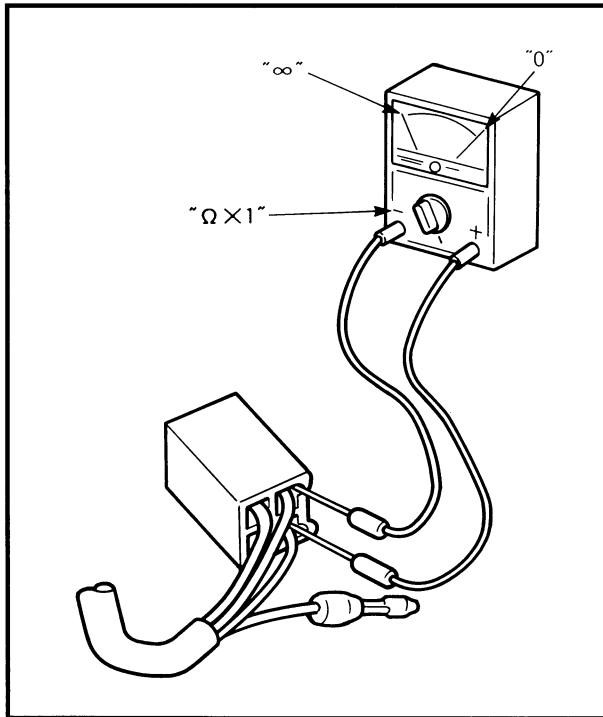
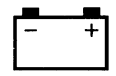
- ① Stator assembly
- ② Rotor assembly
- ③ Rotor rectifier
- ④ Main coil
- ⑤ Sub coil
- ⑥ A.C. protector
- ⑦ A.C. receptacle
- ⑧ Condenser
- ⑨ Charge coil
- ⑩ Pulsar coil
- ⑪ C.D.I. unit
- ⑫ Engine switch
- ⑬ Ignition coil
- ⑭ Spark plug
- ⑮ Oil level switch
- ⑯ Earth terminal

COLOR CODE

B Black
 Br Brown
 G Green
 R Red
 O Orange
 B/W Black/White
 W/R White/Red
 G/Y Green/Yellow

WIRING DIAGRAM





SWITCH INSPECTION

INSPECTION STEPS

Using pocket tester, check switches for continuity between their terminals to determine whether they are correctly connected.

Replace the switch component if any of the combinations does not produce the correct reading.

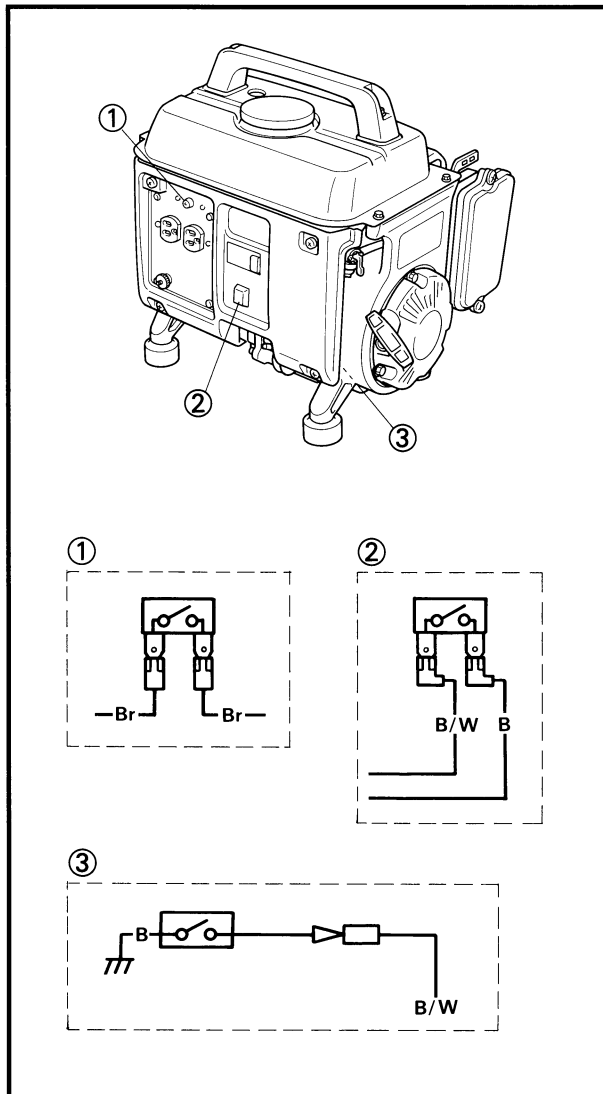


Pocket tester:

YU-03112 (90890-03112)

NOTE:

- Turn the switch to the "ON", "OFF" positions several times.
- Adjust the pocket tester to correct "0" position before checking switches.
- Set the pocket tester selector to "×1" Ω.



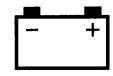
SWITCH CONTINUITY INSPECTION

Refer to "SWITCH INSPECTION" and check for continuity between lead terminals.

Poor connection, no continuity → Correct or replace.

*The coupler locations are circled.

- ① A.C. protector
- ② Engine switch
- ③ Oil level switch



TROUBLE SHOOTING

NO SPARK OR NO WEAK SPARK

NOTE:

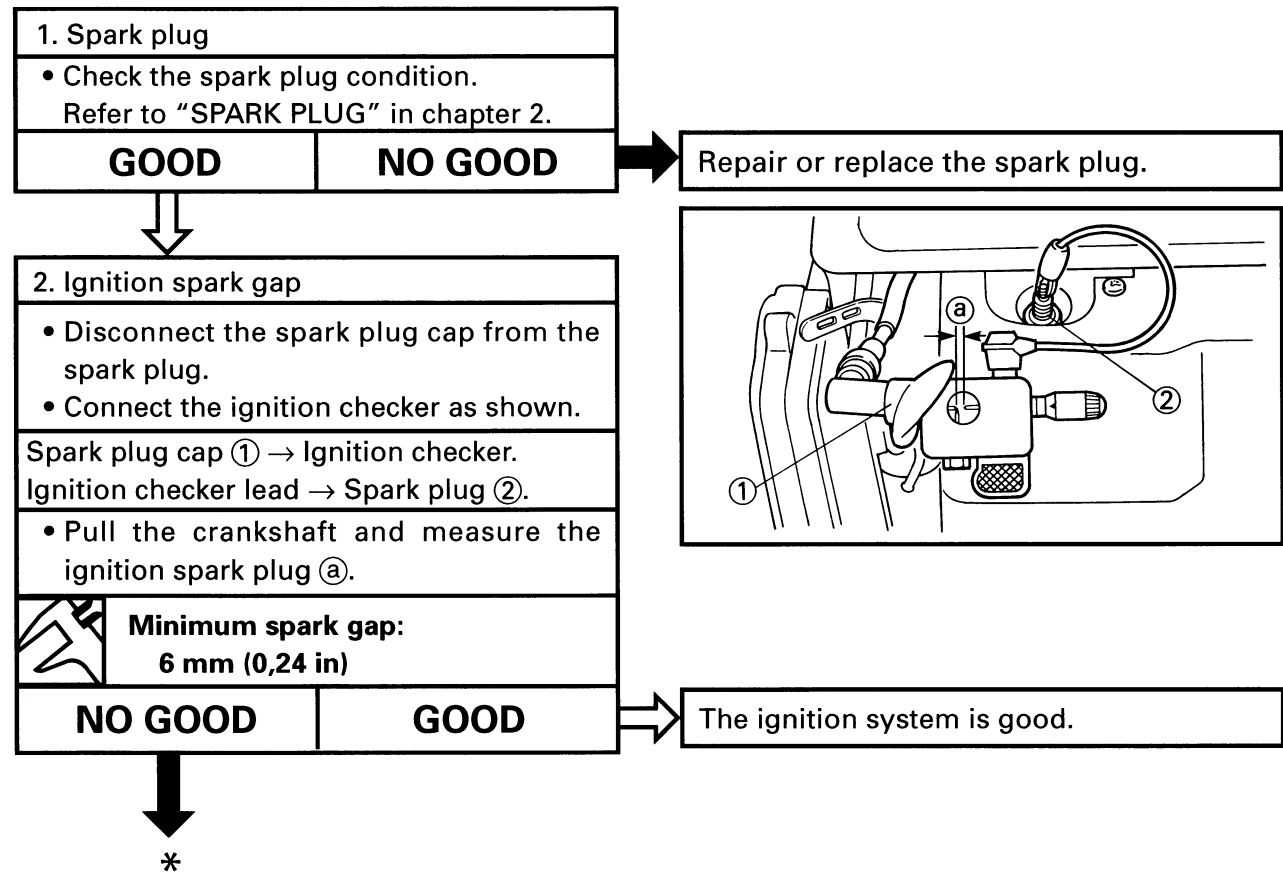
- Remove the following part(s) before trouble shooting.
 - 1) Drain the engine oil
 - 2) Spark plug
 - 3) Control box
 - 4) Oil level switch
- Use this following special tool(s) for troubleshooting.

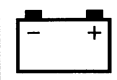


Pocket tester:
YU-03112 (90890-03112)



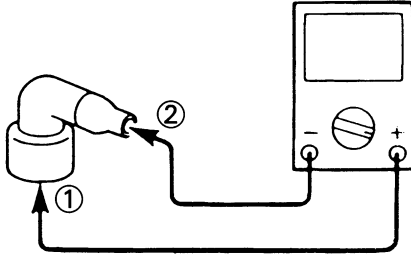
Dynamic spark tester:
YM-34487
Ignition checker:
90890-06754





3. Spark plug cap

- Remove the spark plug cap.
- Connect the Pocket tester ($\Omega \times 1k$) to the spark plug cap.



Spark plug cap resistance:
3.7 ~ 6.3 K Ω at 20°C

GOOD

NO GOOD

NOTE:

- Do not pull out the plug cap from the hi-tension cord.
- Remove→Turn the plug cap counter clockwise.
- Install→Turn the plug cap clockwise.
- Inspect the hi-tension cord, when install the plug cap.
- Cut the hi-tension cord edge to 5 mm then install the plug cap.

Replace the spark plug.



4. Ignition coil resistance

- Remove the ignition coil.
- Connect the Pocket tester ($\Omega \times 1k$) to the coil terminal (secondary). [A]

Tester (+) lead → Hi-tension cord ①.
Tester (-) lead → Terminal ②.



Ignition coil resistance:
3.4 K $\Omega \pm 20\%$ at 20°C

- Connect the Pocket tester ($\Omega \times 1k$) to the coil terminal (primary). [B]

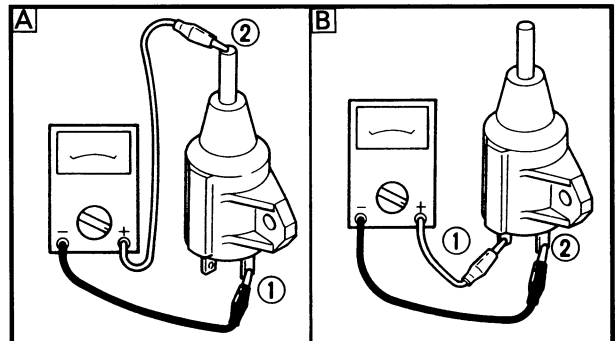
Tester (+) lead → Terminal ①.(Bigger hole)
Tester (-) lead → Terminal ②.(Smaller hole)



Ignition coil resistance:
0.06 $\Omega \pm 20\%$ at 20°C

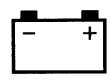
GOOD

NO GOOD



Replace the ignition coil.



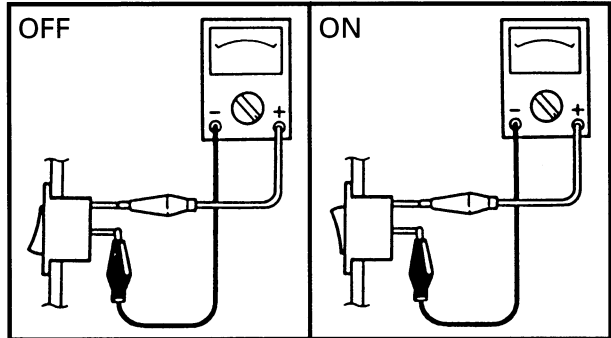


5. Engine switch

- Remove engine switch connector from the control box.
- Connect the Pocket tester ($\Omega \times 1k$) to the engine switch connector and turn the engine switch to "ON".
- Check the engine switch for continuity.

GOOD

NO GOOD



Replace the engine switch.



6. Coil assembly resistance

- Disconnect the coupler from the coil.
- Connect the Pocket tester ($\Omega \times 1k$) to the connector (charge coil).

Tester (+) lead → Brown terminal ③.

Tester (-) lead → White/Red terminal ②.



Coil resistance (charge coil):
 $350 \Omega \pm 20\%$ at 20°C

- Connect the Pocket tester ($\Omega \times 1k$) to the connector (pulsar coil).

Tester (+) lead → Black terminal ①.

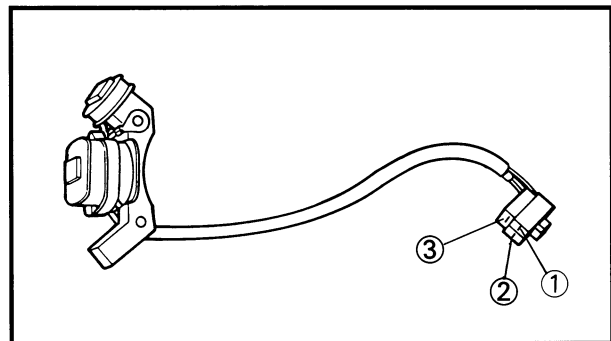
Tester (-) lead → Black terminal ②.



Coil resistance (pulsar coil):
 $38 \Omega \pm 20\%$ at 20°C

GOOD

NO GOOD

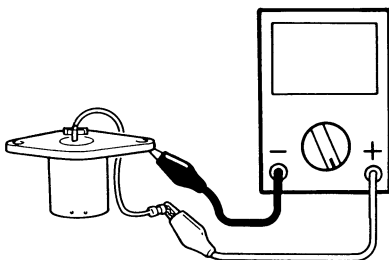


Replace the coil assembly



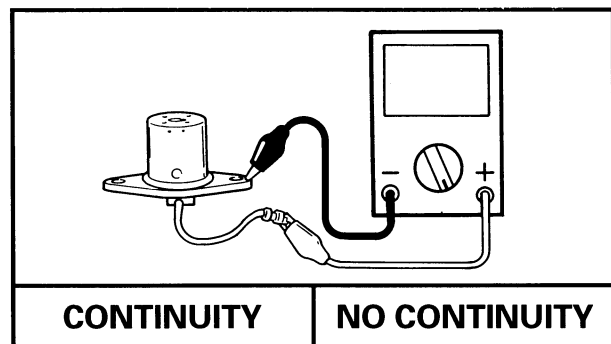
7. Oil level switch

- Remove the oil level switch. Refer to "CRANKCASE" in chapter 3.
- Connect the Pocket tester ($\Omega \times 1k$) as shown.



CONTINUITY

NO CONTINUITY



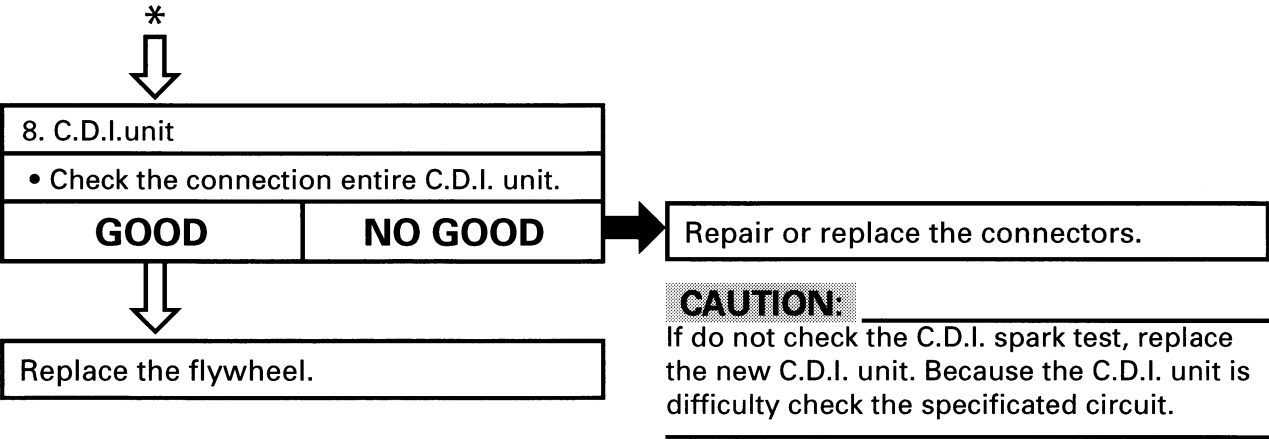
CONTINUITY

NO CONTINUITY



Replace the oil level switch.





TROUBLE SHOOTING

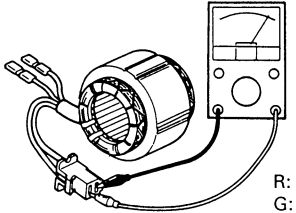
GENERATOR DOES NOT GENERATE

NOTE: ➡ Indicates a value which meets the Service Date or state without any problems in inspection.

➡ Indicates a state in which a problem has been found in the inspection and remedy is necessary.

Check stator main and sub coils for continuity.

Main coil: R—Br
Sub coil: G—G



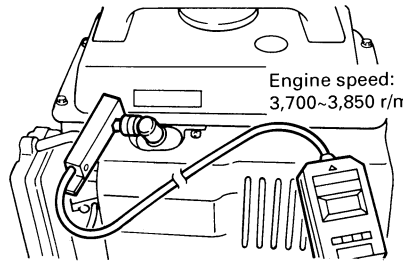
R: Red
G: Green
Br: Brown

Continuity	No continuity
------------	---------------

Check for start to ground.

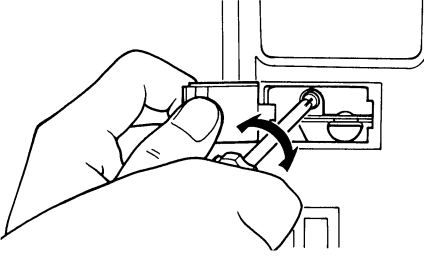
Check engine speed. (No load) **Step #1**

Engine speed:
3,700~3,850 r/min



OK	NG
----	----

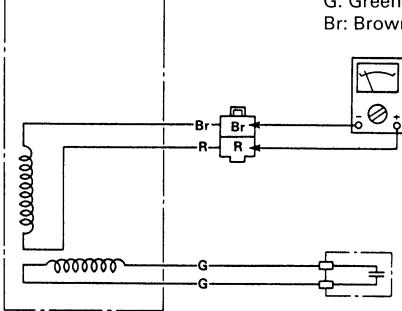
Adjust engine speed. **Step #2**



OK	NG
----	----

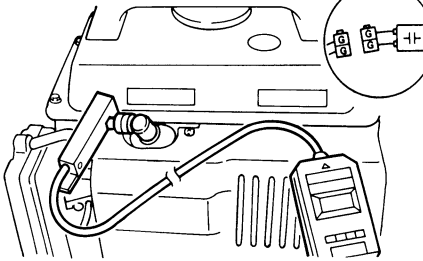
Check voltage generated by stator main coil under no load.

R: Red
G: Green
Br: Brown



OK	0V	LOW
----	----	-----

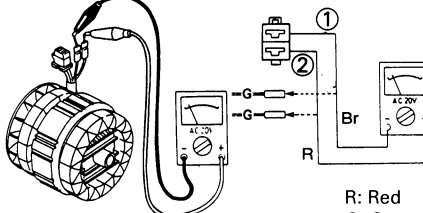
Operable with condenser connection removed.



OK	NG
----	----

Check engine side.

Remove sub coil connection and check each generated voltage while running.



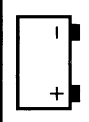
① Primary coil:2~5V
② Secondary coil:2~6V

R: Red
G: Green
Br: Brown

OK	NG
----	----

GENERATOR SYSTEM

ELEC



Check A.C. receptacle.

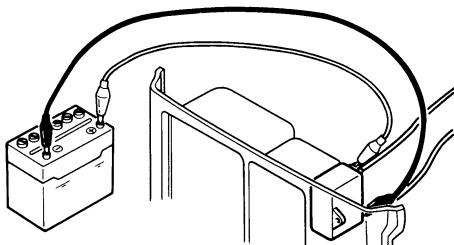
Check voltage generated by main coil after rotor is magnetized.

Rotor remagnetized

1. Start the engine (no load)
2. Connect the battery (D.C. 12 V) to the condenser terminal at the moment and the rotor will be magnetized instantly.

CAUTION:

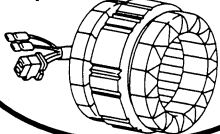
Do not connect the battery more than a few seconds. This may cause deteriorate the battery.



LOW

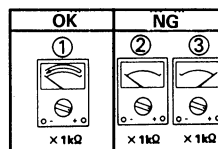
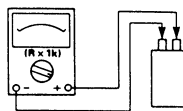
0V

Replace stator assembly.



Check condenser characteristics.

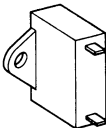
- ① Needle swings and return back quickly.
- ② Needle does not swing.
- ③ Needle does not return



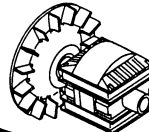
OK

NG

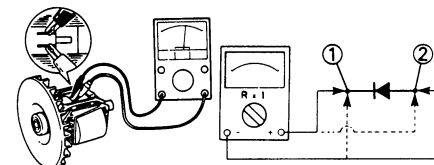
Replace condenser assembly.



Replace rotor assembly.



Check rotor rectifier.



Pocket tester connecting point.		OK
(+) Red	(-) Black	
①	②	○
②	①	X

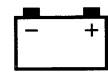
○ : Continuity
X : No continuity

OK

NG

Replace rotor rectifier.

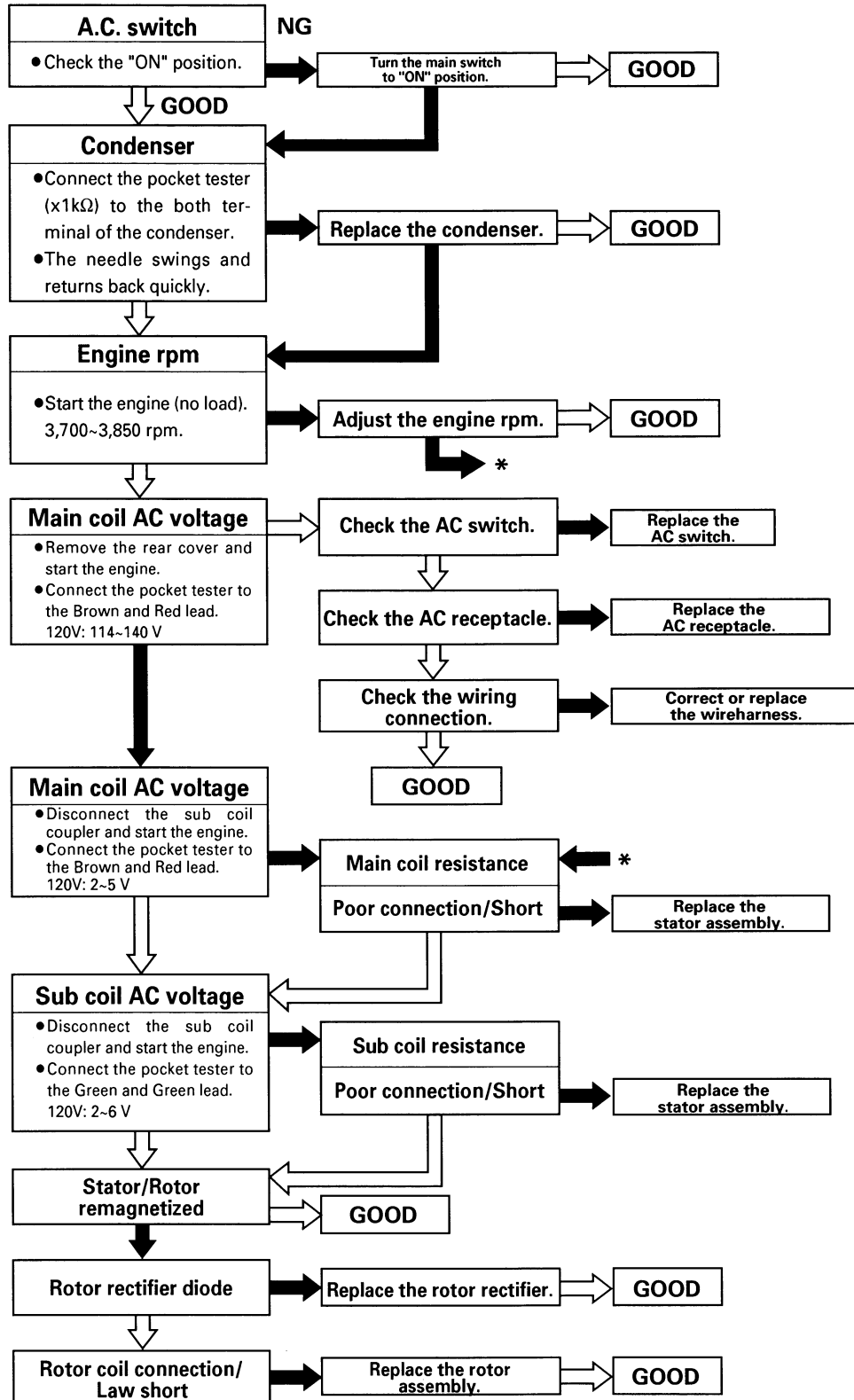




TROUBLE SHOOTING

GENERATOR DOES NOT GENERATOR

NOTE: ⇨ Indicates a value which meets the Service Date or state without any problems in inspection.
 ➡ Indicates a state in which a problem has been found in the inspection and remedy is necessary.





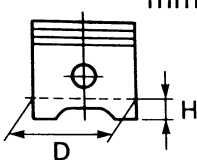
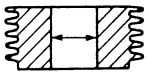
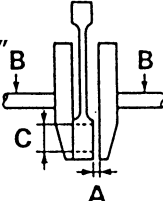
SPECIFICATIONS

GENERAL SPECIFICATIONS

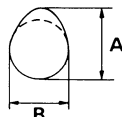
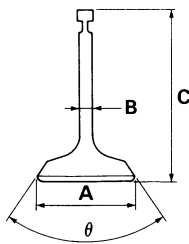
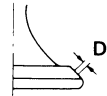
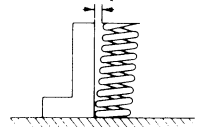
Unit		EF1000A
MODEL CODE NUMBER		7TA
DIMENSIONS:		
Overall length	mm (in)	399 (15.7)
Overall width		305 (12.0)
Overall height		410 (16.1)
Dry weight	kg (l•b)	23.0 (50.7)
ENGINE:		
Type		4-Stroke OHV air cooled
Cylinder arrangement		1
Displacement	ml (cm ³)	84 (84)
Bore × stroke	mm (in)	50.0 × 43.0 (1.97 × 1.69)
Compression ratio		8.4:1
Rated out put 60Hz kW (PS) /3.600 r/min		1.5 (2.0)
Operating hours	60Hz Hours	5.5
Fuel		Unleaded regular gasoline
Fuel tank capacity	L (Imp gal, US gal)	3.8 (0.84, 1.00)
Engine oil capacity	L (Imp qt, US qt)	0.43 (0.38, 0.45)
Engine oil grade		4-stroke engine oil API Service Classification SE or SF if not available, SD
ELECTRICAL:		
Ignition system:		C.D.I.
Ignition timing		B.T.D.C. 23°
Spark plug type		BPR6HS (NGK)
Spark plug gap	mm (in)	0.6~0.7 (0.024~0.028)
Generator system:		
A.C. output		
Rated voltage	V	120
Frequency	Hz	60
Rated output	kVA	0.8
Rated current	A	6.7
Safety device type		A.C. protector



MAINTENANCE SPECIFICATIONS ENGINE

Item	Standard	Limit
Piston: Piston clearance Piston size "D" 	mm (in) 0.020 ~ 0.035 (0.00078~0.00137) 49.974 ~ 49.994 (1.967~1.968) 10.0 (0.3937)	49.974 (1.967)
Piston pin: Piston pin diameter	mm (in) 11.996 ~ 12.000 (0.4723~0.4724)	11.95 (0.470)
Piston ring: Top ring End gap Side clearance 2nd ring End gap Side clearance Oil ring Side clearance	Barrel  0.1~0.25 (0.004~0.01) 0.06 (0.002) Plane  0.1~0.25 (0.004~0.01) 0.04 (0.001) Solid + expander  0.2~0.4 (0.008~0.015)	 0.9 (0.035) 0.15 (0.0059) 0.9 (0.035) 0.15 (0.0059) 0.15(0.0059)
Cylinder head: Warp limit	mm (in) 0.1 (0.004)	
Cylinder: Bore size	mm (in)  50.005 ~ 50.015 (1.9687~1.9690)	
Crankshaft: Big end side clearance "A" Runout limit "B" Crank pin outside diameter "C" 	mm (in) 0.2~0.6 (0.008~0.024) 0.02 (0.0008) 22.0 (0.866)	0.8(0.03) 0.04 (0.0016) 21.9 (0.862)
Carburetor: Type/Quantity I.D.mark Bore size Float height Main jet Main air jet Pilot air jet Pilot outlet Valve seat Main nozzle Pilot jet Pilot screw Throttle valve Rated engine speed	 mm (in) mm (in) mm (in) mm (in) mm (in) mm (in) r/min	 10 (0.39) 17.0 (0.67) 56.3 1.3 (0.051) 0.8 (0.03) 0.8 (0.03) 1.8 (0.07) 11A #42.5 1-7/8 110 3,700~3,850



Item		Standard	Limit
Connecting rod:	mm (in)		
Small end diameter "A"		12.006 ~ 12.020 (0.4727~0.4732)	0.1(0.004)
Oil clearance		0.016 ~ 0.034 (0.00063~0.00134)	
Big end diameter "B"		21.977 ~ 21.995 (0.8652~0.8659)	0.1 (0.004)
Oil clearance		0.005 ~ 0.023 (0.00020~0.00090)	
Limit			
Camshaft:	mm (in)		
Camshaft outside diameter			
Cam dimension			
"A"		IN 20.5 (0.807) EX 20.5 (0.807)	
"B"		IN 16.0 (0.63) EX 16.0 (0.63)	
Camshaft journal		15.965 ~ 15.990 (0.6285~0.6295)	15.95 (0.6280)
Limit			
Valve:	mm (in)		
Valve dimension			1.2 (0.047) 0.01 (0.0004)
Head diameter "A"	IN 19 (0.748) EX 17 (0.669)		
Stem diameter "B"	IN 5 (0.196) EX 5 (0.196)		
Length "C"	IN 53.4 (2.10) EX 53.6 (2.11)		
Seat width "D"	IN 0.7 (0.027) EX 0.7 (0.027)		
Valve seat bend limit		90°	
"θ"			
Valve guide			
Guide inside diameter	IN 5.0 ~ 5.012 (0.1969~0.1973) EX 5.0 ~ 5.012 (0.1969~0.1973)		
Stem to guide clearance	IN 0.037 ~ 0.064 (0.00146~0.00252) EX 0.045 ~ 0.073 (0.00177~0.00283)		
Valve clearance	IN 0.1 (0.004) EX 0.1 (0.004)		
Push rod:	mm (in)		
Runout limit			0.5 (0.02)
Valve spring:	mm (in)		
Free length	IN 27.4 (1.0787) EX 27.4 (1.0787)		0.8 (0.03)
Seat length	IN 18.1 (0.7126) EX 18.1 (0.7126)		
Set force	IN 5.6 kg (12.3 lb) EX 5.6 kg (12.3 lb)		
Tilt limit			
			



ELECTRICAL

Item	Standard	Limit
GENERATOR:		
Type	Brush-less, self-exciting, single-phase, A.C. generator	
Number of poles	2	
Excitation	Self magnetization	
Initial excitation	Residual magnetization	
Driving method	Direct connection	
Rated power factor	1.0	
Frequency fluctuation	Less than 5%	
Voltage	120	
Frequency	60	
Coil resistance		
Main coil	1.45	
Sub coil	3.45	
Rotor coil	8.05	
ELECTRICAL:		
Ignition system:		
Type/I.D. mark/manufacture	C.D.I. magneto/7TA/MORIYAMA	
Pulsar coil resistance	38	
Charge coil resistance	350	
Ignition coil:		
Ignition timing	B.T.D.C. 22.3~23.7°	
Primary coil resistance	0.06	
Secondary coil resistance	3.4	
Plug cap resistance	3.7~6.3	
A.C. excess current check	Protector	



TIGHTENING TORQUE

	Thread size	Torque Nm (m•kg, ft•lb)	Remarks
Spark plug	M14× 1.25	20 (2.0, 14)	
Cylinder head cover	M 6× 1.0	9 (0.9, 6.5)	
Cylinder head	M 6× 1.0	11 (1.1, 8.0)	
Crankcase cover	M 6× 1.0	10 (1.0, 7.2)	
Connecting rod	M 6× 1.0	9 (0.9, 6.5)	
Rotor	M 8× 1.25	23 (2.3, 17)	
Governor arm	M 6× 1.0	6 (0.6, 4.3)	
Valve clearance adjusting nut	M 6× 0.5	10 (1.0, 7.2)	
Fly wheel	M12× 1.25	40 (4.0, 29)	
Coil assembly	M 6× 1.0	7 (0.7, 5.1)	
Fuel tank	M 6× 1.0	7 (0.7, 5.1)	
Muffler	M 6× 1.0	7 (0.7, 5.1)	
Carburetor	M 6× 1.0	7 (0.7, 5.1)	
Muffler protector	M 6× 1.0	6 (0.6, 4.3)	
Front flame	M 8× 1.25	10 (1.0, 7.2)	
Rear flame	M 6× 1.0	10 (1.0, 7.2)	
Recoil starter	M 6× 1.0	7 (0.7, 5.1)	

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

Thread size	Tightening torque		
	Nm	m•kg	ft•lb
M 4	2	0.2	1,4
M 5	3	0.3	2,2
M 6	7	0.7	5,1
M 7	10	1.0	7,2
M 8	15	1.5	10,8
M10	30	3.0	21,7
M12	60	6.0	43,4

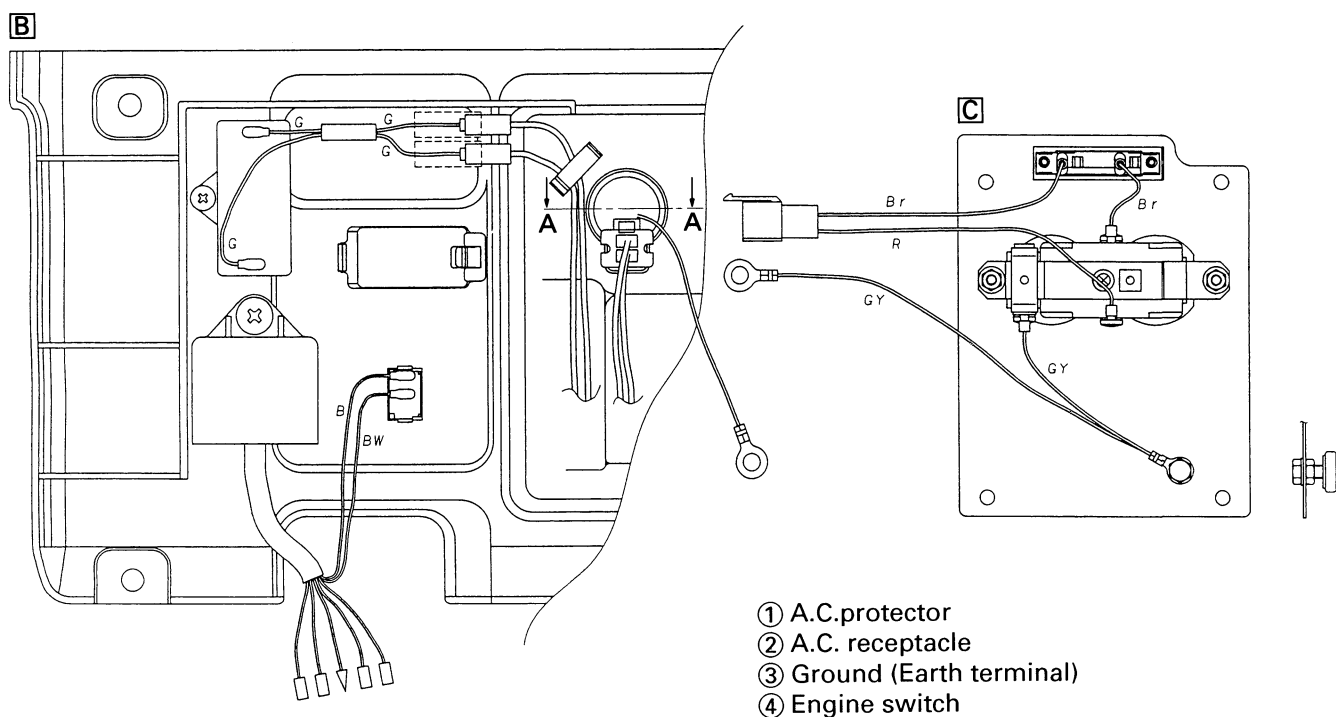
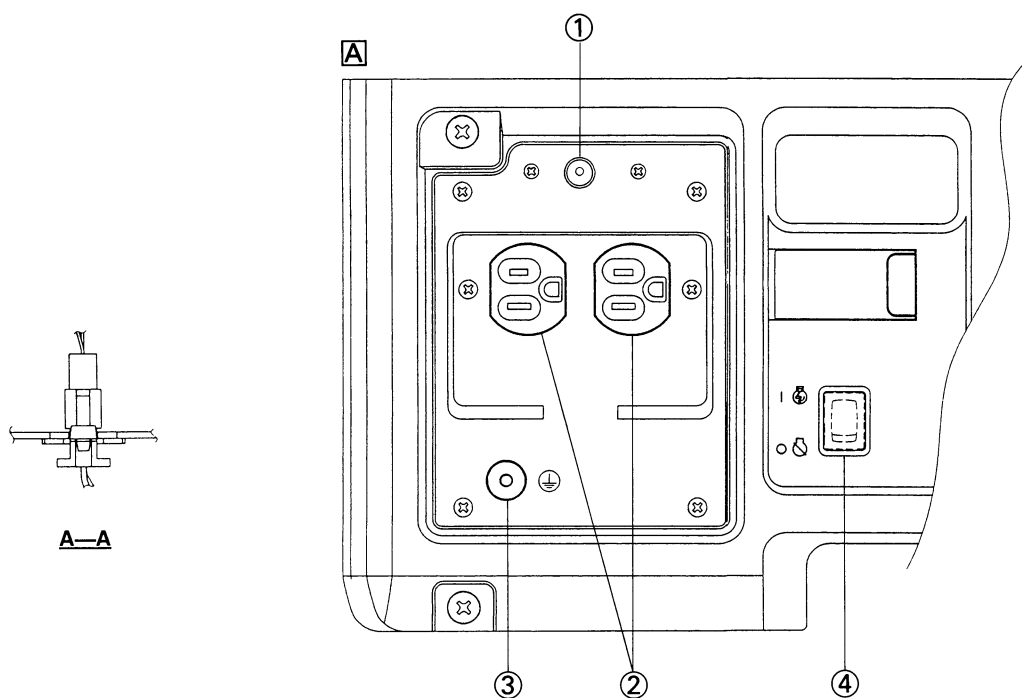
DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm cm	Millimeter Centimeter	10⁻³ m 10⁻² m	Length Length
kg	Kilogram	10³ gram	Weight
N	Newton	1 kg × m/sec²	Force
N•m m•kg	Newton meter Meter-kilogram	N × m m × kg	Torque Torque
Pa N/mm	Pascal Newton per millimeter	N/m² N/mm	Pressure Spring rate
L cm³	Litter Cubic centimeter	—	Volume or Capacity
tr/mn	Rotation per minute	—	Engine speed



CABLE, HOSE ROUTING

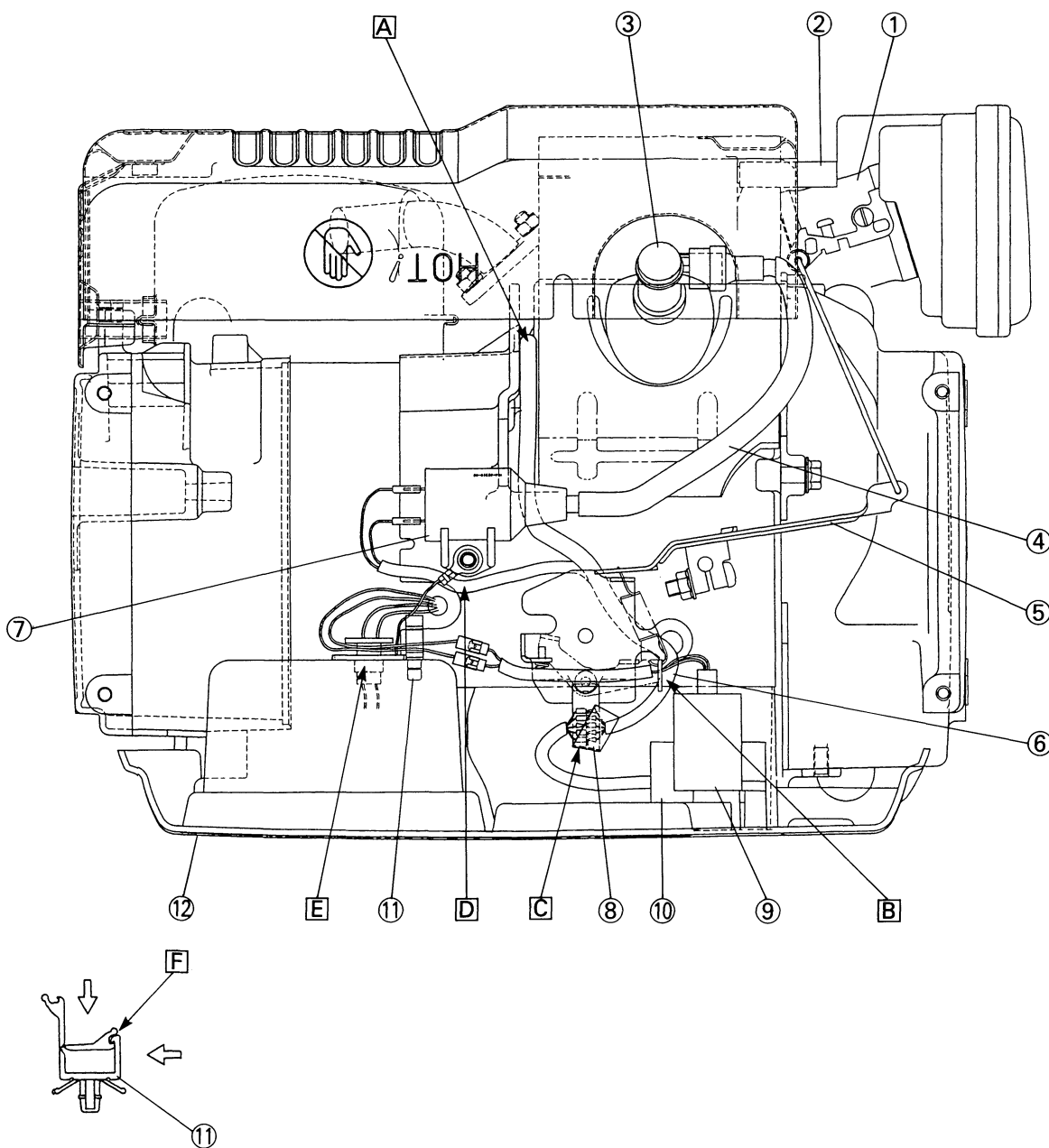
- A** control box panel
- B** Behind control box
- C** Behind control box panel





- ① Carburetor
- ② Breather hose
- ③ Spark plug cap
- ④ High tension cord
- ⑤ Governor arm
- ⑥ Wire harness
- ⑦ Ignition coil
- ⑧ Clamp
- ⑨ Condenser
- ⑩ C.D.I unit
- ⑪ Clamp
- ⑫ Control box

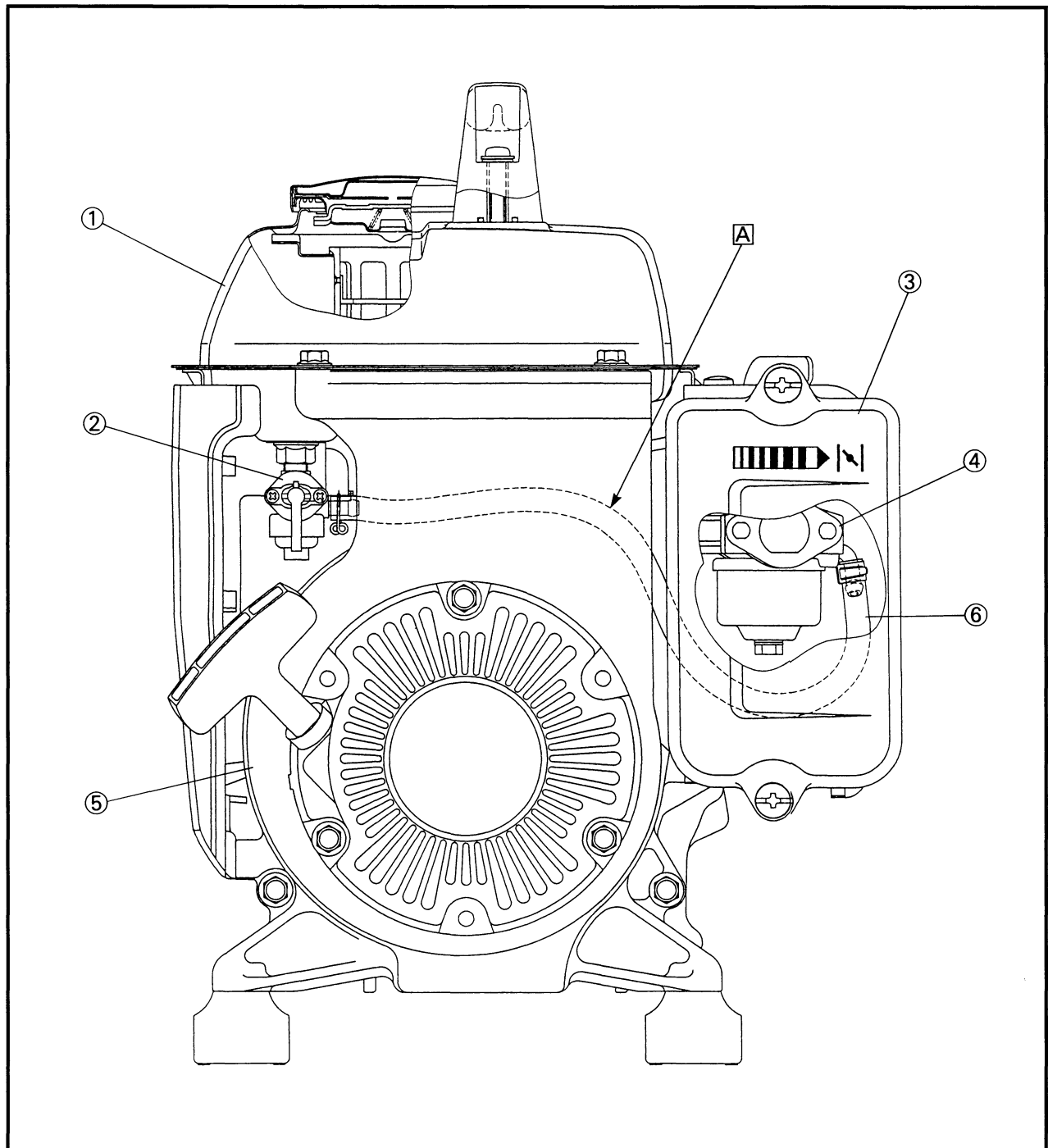
- A Pass the wireharness into the lib on the crankcase.
- B Pass the wireharness under the governor stay.
- C Clamp the part of the connector.
- D Pass the ignition coil read under the ground lead.
- E Attach the grommet to the hole of the control box.
- F Push in the upper side of the clamp.





- ① Fuel tank
- ② Fuel cock
- ③ Air filter
- ④ Carburetor
- ⑤ Rear frame
- ⑥ Fuel hose

- A** Pass the fuel hose through on the crankcase to under the carburetor.

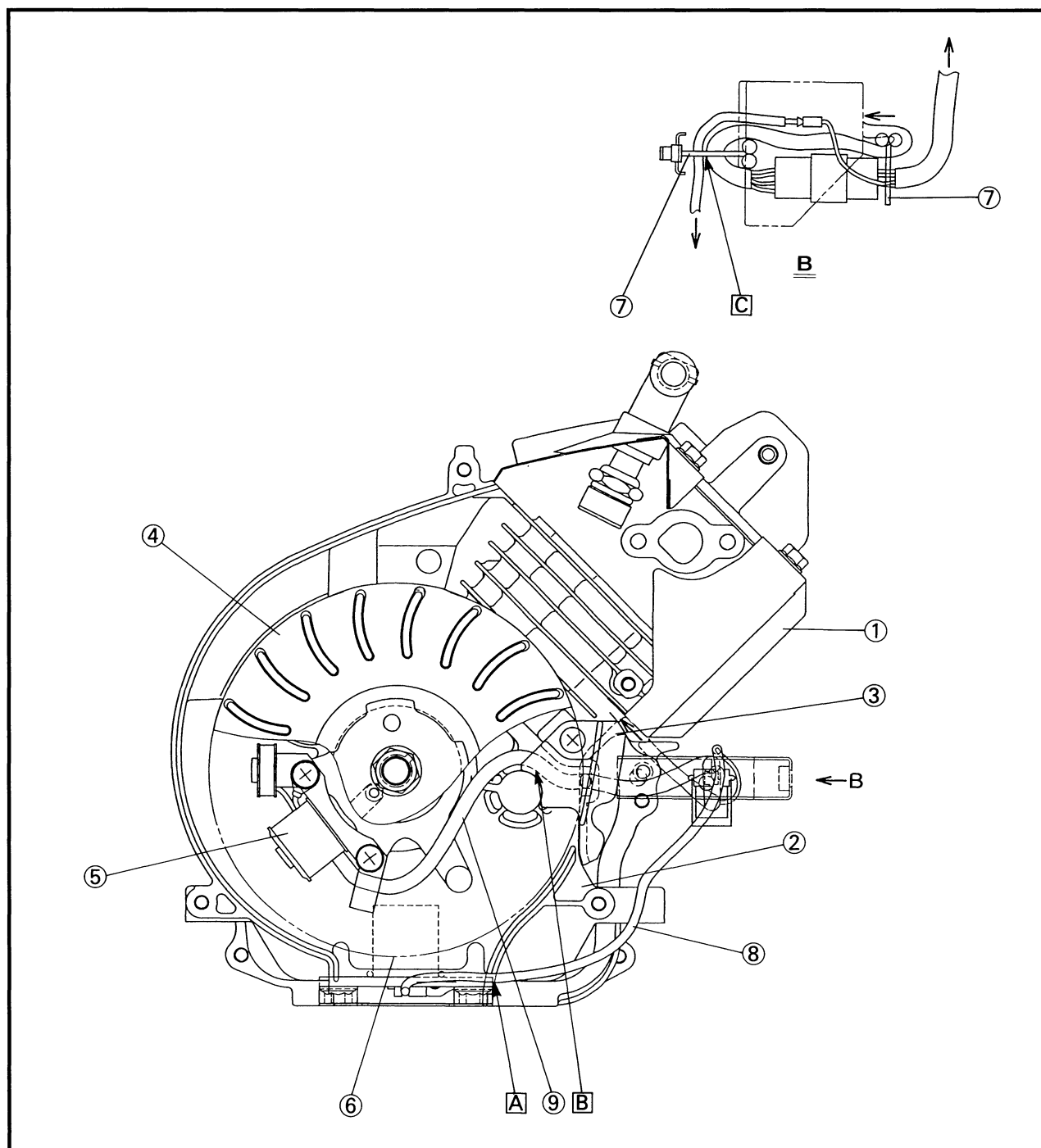




- ① Air shroud under
- ② Crankcase
- ③ Plate
- ④ Flywheel
- ⑤ Coil assembly
- ⑥ Oil level switch
- ⑦ Clamp
- ⑧ Oil level switch lead
- ⑨ Coil assembly lead

- B** Pass the coil assembly lead to the crankcase and plate.
- C** Clamp with the oil level switch lead and wireharness.

- A** Set in to the oil level switch lead to the slit of the crankcase.





LIT196160083

YAMAHA
YAMAHA MOTOR CO., LTD.